RANGE PLANT COMMUNITY TYPES AND CARRYING CAPACITY FOR THE MONTANE SUBREGION OF ALBERTA

Alberta

SUSTAINABLE RESOURCE DEVELOPMENT
PUBLIC LANDS AND FORESTS DIVISION

RANGE PLANT COMMUNITY TYPES AND CARRYING CAPACITY FOR THE MONTANE SUBREGION

Sixth approximation

(Please note this edition is a revision of the 2nd, 3rd, 4th and 5th approximations of the Range plant community types and carrying capacity for the Montane subregion.
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This guide is also available on-line at: http://www3.gov.ab.ca/srd/land/m_rm_classification.html

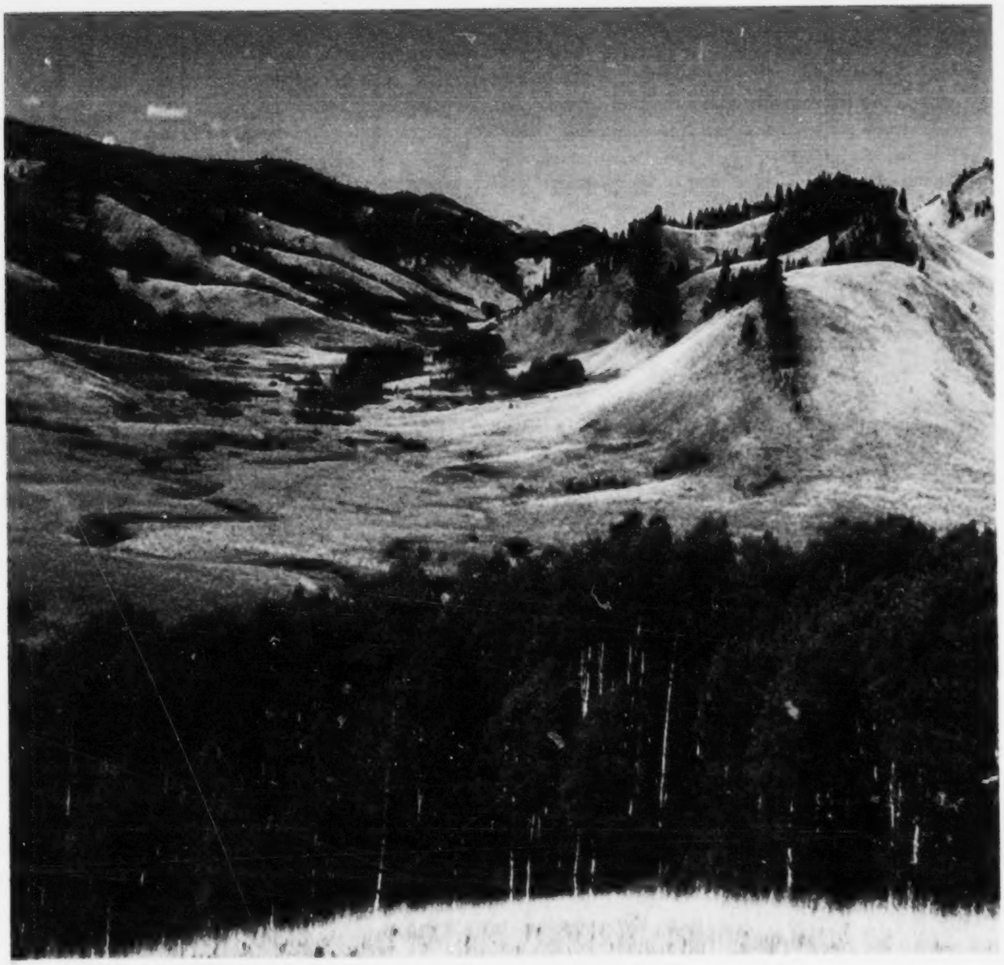

Photo 1. Rolling topography of the Montane subregion: This illustrates the grassland-shrubland and grassland-forest ecotones of the Montane subregion.

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Abstract

The Montane subregion is one of the most diverse subregions within the province of Alberta. The ecological diversity of this subregion creates a landscape that consists of a mosaic of different vegetative communities. This diversity means that these lands are valued for a multitude of uses, including summer range for livestock, prime habitat for many species of wildlife, productive watersheds, wood fibre production and recreation. Despite the importance of many of the vegetation types in the Montane for livestock grazing, there is little information available on how grazing influences the plant community. There is little information on forage productivity, carrying capacity and the associated community types that develop through succession or from disturbance including grazing. This lack of information makes it difficult to develop management prescriptions. As a result "Carrying capacity guides" are being developed for each natural and subregion in the province to provide a framework that would easily group the vegetative community types. It is hoped this classification system can be used by field staff to assess carrying capacity and evaluate range health on lands within each region.

This guide represents the analysis of 1292 plots described in the Montane subregion This guide also includes plots done in the Montane subregion of Banff and Jasper National Parks, 8 new community types described in the Ya Ha Tinda area west of Sundre and 7 community types described in the Cypress Hills. The 1292 plots represent 141 community types. These types are split into:

A. Native grasslands (Banff and Jasper Mountain ecodistricts)	14 types
B. Native grasslands (Blairmore and Morley Foothills ecodistricts)	23 types
C. Disturbed grasslands (Blairmore and Morley Foothills ecodistricts)	15 types
D. Native shrublands	17 types
E. Conifer types	26 types
F. Mixedwood types	13 types
G. Deciduous types	16 types
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The dominant plant species, canopy cover, environmental conditions, response to grazing, forage production and carrying capacity are outlined for each type.

Acknowledgements

The creation of this report would not be possible without data collected in other projects. We would like to acknowledge Parks Canada for allowing us to use data from the Ecological Land Classification of Banff and Jasper National Parks (Holland and Coen 1982). Much of the grassland and shrubland vegetation data collected by Ian Corns and Peter Achuff were incorporated into the Banff and Jasper Mountain ecodistricts of this guide. We would like to acknowledge the work done by Bill Thompson and Paul Hansen who completed the Classification and Management of Riparian and Wetland Sites of Alberta's Grassland Natural Region. All plots done in the Montane subregion for this riparian classification were included in this guide. We would like to acknowledge the Rocky Mountain Forest Reserve Range Association for their continued support in supplying inventory data for the update of the various guides found in the Forest Reserve of Southwestern Alberta. We would also like to acknowledge the work of Lindsay Poulin and Darlene Moisey on the Cypress Hills classification and Karen Sundquist on the shrubland classification.

Introduction

The province of Alberta is covered by a broad spectrum of vegetation regions from prairie in the South, to alpine vegetation in the mountains and dense forests in the Central and Northern part of the province. These broad vegetation regions have been classified into 20 subregions for the province (Strong and Thompson 1995). Each of the 20 subregions consists of groups of plant communities which are influenced by environmental conditions and human impacts. Intensive management of these regions requires the ability to recognize the vegetative communities that have similar productivities and respond to disturbance in the same way. The increase in use of Alberta's northern forests has recently stimulated efforts to develop detailed classification systems. Some of these classification systems include "Field guide to Forest ecosystems of West Central Alberta" (Corns and Annas 1986) and "Field Guide to Ecosites of Southwestern Alberta" (Archibald et al. 1996).

The vegetative communities in the province of Alberta are highly regarded by most resource managers for their ability to provide a wide variety of benefits. They are a classic example of multiple use land, providing summer range for livestock, prime habitat for many species of wildlife, wood fibre, productive watersheds and recreational areas. Despite the importance of these vegetation types for livestock grazing, there is little information available on how grazing affects their production. Specifically, there is little data on the levels of utilization which are detrimental to a plant communities health. There is also little information on forage productivity, carrying capacity and associated community types that occurs with grazing. Traditionally, these community types have been rated at 5 ac/AUM or 60 ac/head/year, but recent work has shown that productivity can vary significantly depending upon the ecological conditions of the site.

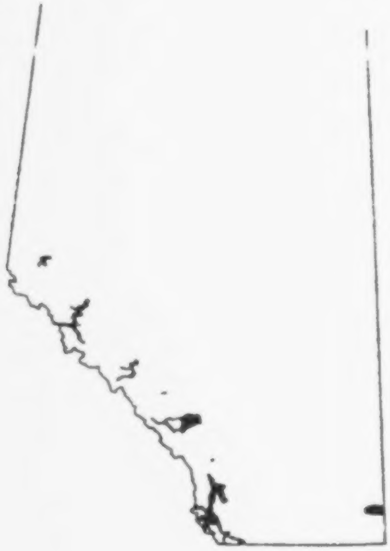
The purpose of this guide was to develop a framework that would easily group the vegetative community types in the Montane subregion of the province. The ultimate goal is a classification system that can be used by the field staff to assess carrying capacity and evaluate range health on lands within the region.

Climate of Montane subregion

The Montane subregion composes only 0.9 percent of the province and is found in an area south of Chain Lakes to the Montana border, portions of the Bow and Athabasca river valleys and isolated areas near Ya Ha Tinda and Grande Cache (Map 1) (Strong and Leggat 1992). The Montane is distinguished from the other subregions by the presence of Douglas-fir (*Pseudotsuga menziesii*), limber pine (*Pinus flexilis*) and lodgepole pine (*Pinus contorta*). Elevationally the Montane occurs below the Subalpine in the mountains and above the Foothills Fescue grass and Aspen parkland subregions in southern Alberta.

Yearly precipitation ranges 308 mm to 1279 mm with two precipitation peaks occurring in May-June and again in August-September (Strong 1992). Summer monthly temperatures average 11.9°C and are 2°C warmer than the Subalpine and 2°C colder than the Foothills Fescue grass subregions. The Montane has the warmest winter temperatures of any forested region in

Alberta because of chinook activity and reduced influence of Arctic air (Strong 1992).



Map 1. Location of Montane subregion in Alberta

Approach and Methods of Classification

Approach: Ecological classification hierarchy and terminology

The system of classification in this guide was initially based on the community type approach of Mueggler (1988). Mueggler's system was chosen over the habitat type approach (Daubenmire 1952) or ecosystem association approach (Corns and Annas 1986) because it could classify plant communities irregardless of their successional status. However, as the philosophy of rangeland health and proper functioning condition of a site evolved, it became apparent (through data analysis) that there was a need to also organize the various plant communities based on their response to disturbance (i.e. disturbance vs. natural succession) within an area under similar environmental influences.

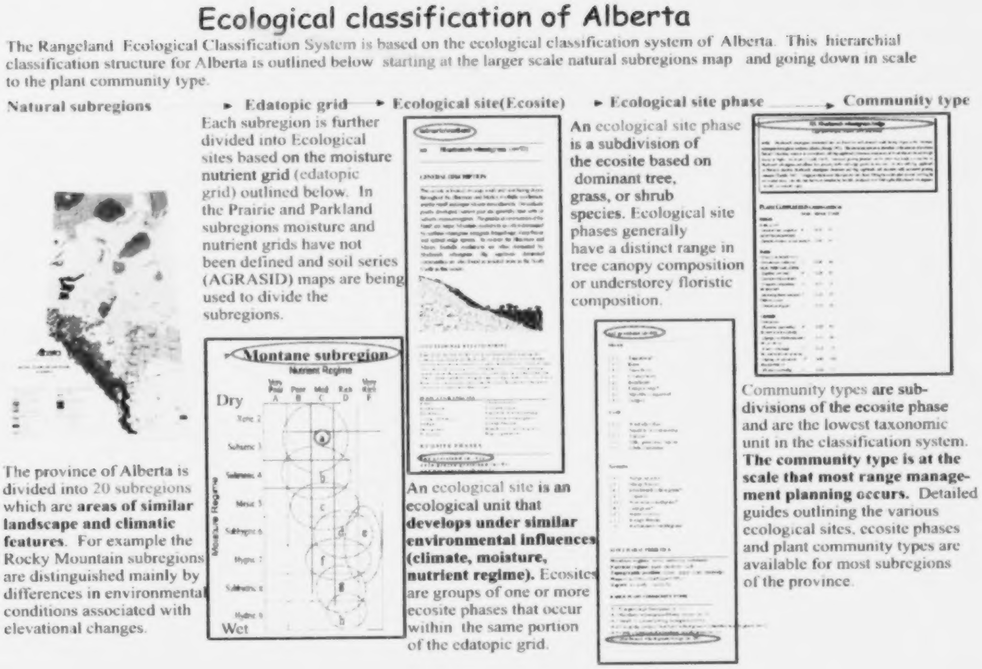
It was determined that the ecosystem classification system developed by Corns and Annas (1986) and Beckingham et al. (1996) could accommodate this additional requirement. Thus, the new system developed for rangelands is a combination of Mueggler (1988) and Beckingham et al. (1996). Consequently, this guide adopts a similar ecological unit classification hierarchy (**ecosite, ecosite phase, plant community**). In an effort to first, link the hierarchical system with the historic rangeland system, and second, to create a provincially standardized rangeland approach, slightly different classification terminology was developed. The new terms **ecological site** and **ecological site phase** (replacing Beckingham et al.'s [1996] ecosite and ecosite phase terms respectively), provide subtle distinction to recognize the blending of the old systems and still be recognizable to readers familiar with the original terminology. See figure 1 for a flow chart of both classification and general presentation of information.

Methods: Plant community classification

Sampling for this guide occurred within the Montane subregion . This guide outlines the classification of 1292 plots described from 1991 to 2004 .

The procedure for inventory of plots followed the Range Survey Manual (1992) and uses the **MF5 form**. A plot consisted of a 10 m x 10 m macroplot and ten randomly selected 1 m x 1 m microplots to record the canopy cover of shrubs and ten nested 20 cm x 50 cm microplots to record the canopy cover of forbs and grass. The data for each site was analyzed using the multivariate analysis techniques of classification and ordination. Classification is the assignment of samples to classes or groups based on the similarity of species. A polythetic agglomerative approach was used to group the samples. This technique assigns each sample to a cluster which has a single measure. It then agglomerates these clusters into a hierarchy of larger and larger clusters until finally a single cluster contains all the samples (Gauch 1982). Cluster analysis was performed in SAS and Euclidean distance was used as the Cluster Distance Measure and Ward's method was used in the Group Linkage Method. The groupings generated in cluster analysis were overlain on the site ordination to determine final groupings. Ordination was used to find relationships among species, communities and environmental variables. Ordination reduces the dimensionality of the data to 1-3 most important axes to which environmental gradients can be assigned. The ordination technique used in the analysis of the data was DECORANA (Detrended Correspondence Analysis). DECORANA detrends and rescales the axes thereby reducing the arching and compression of axes problems associated with other ordination techniques (Reciprocal averaging, Principle Components Analysis). Once final groupings were determined on the ordination specific environmental variables can be assigned to the variation outlined on the ordination axes.

Plant community type summaries were generated in SAS, by averaging plant species composition, range in composition, and percent constancy of occurrence, among vegetation inventory plots which were part of a community type. Environmental data was subsequently sorted into the same plant community groupings to create the plant community descriptions outlined in this guide. The number of sample plots on which the description was based is also provided (e.g. n=16).



Ecological classification of Alberta

The Rangeland Ecological Classification System is based on the ecological classification system of Alberta. This hierarchial classification structure for Alberta is outlined below starting at the larger scale natural subregions map and going down in scale to the plant community type.

Natural subregions ► **Edatopic grid** ► **Ecological site(Ecosite)** ► **Ecological site phase** ► **Community type**

The province of Alberta is divided into 20 subregions which are **areas of similar landscape and climatic features**. For example the Rocky Mountain subregions are distinguished mainly by differences in environmental conditions associated with elevational changes.

Each subregion is further divided into Ecological sites based on the **moisture nutrient grid** (edatopic grid) outlined below. In the Prairie and Parkland subregions moisture and nutrient grids have not been defined and soil series (AGRASID) maps are being used to divide the subregions.

An ecological site **is an ecological unit that develops under similar environmental influences (climate, moisture, nutrient regime).** Ecosites are groups of one or more ecosite phases that occur within the same portion of the edatopic grid.

An ecological site phase **is a subdivision of the ecosite based on dominant tree, grass, or shrub species.** Ecological site phases generally have a distinct range in tree canopy composition or understorey floristic composition.

Community types **are sub-divisions of the ecosite phase** and are the lowest taxonomic unit in the classification system. **The community type is at the scale that most range management planning occurs.** Detailed guides outlining the various ecological sites, ecosite phases and plant community types are available for most subregions of the province.

Figure 1. Layout of the Ecological Classification System for Alberta

Range Management Concepts and Methods

Ecologically sustainable stocking rates

Ecologically sustainable stocking rates (ESSR) values are suggested for each plant community. These values reflect the maximum number of livestock (e.g. hectares(ha)/animal unit month(AUM)) that can be supported by the plant community given inherent biophysical constraints and the ecological goal of sustainable health and proper functioning of the plant community. When the ESSR is multiplied by the area (e.g. ha) of a plant community polygon the result is termed **carrying capacity (CC)**, and is expressed as AUMs. Often the CC must be adjusted for management factors (e.g. reduced livestock distribution), management goals (e.g. improve rangeland health, multiple use and values, etc.), drought conditions, and other natural phenomena impacting the site (e.g. forage quality, fire, pests, etc.). This adjusted/reduced value is the **grazing capacity (GC)**. The GC values are not provided in the plant community guide because the necessary adjustments are determined by the rangeland resource manager.

Suggested ESSR values were determined from a combination of clipping studies, long-term rangeland reference area data, estimated production, range health trends and historical grazing experience. In order to sustain ecological health and function of the plant community, the ESSR has been established by the resource manager and is based on the ecological, climatic and seasonal conditions for each community type. In determining ESSR the forage requirements for one Animal Unit (AU) has been set at 455 kg of dry matter per month. The remaining biomass production (carry over), is allocated for the maintenance of ecological functions (e.g. nutrient cycling, viable diverse plant communities, hydrological function, and soil protection, etc.) and plant community services (forage production, habitat maintenance, etc.). The allocation of biomass production in this manor is well established, and supported, by the scientific community and the amount required, varies with Natural Subregion (Holechek et al. 1995).

Rangeland Health

Range health is determined by comparing the functioning of ecological processes on an area (e.g. plant community polygon) of rangeland to a standard (i.e. RPC) described within an ecological site description. An ecological site is similar to the concept of **range site**, but a broader list of characteristics are described. An ecological site is defined by the Task Group on Unity and Concepts (1995) as, "*a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation*". This guide can be used to determine the appropriate **reference range plant community**, within an ecological site, for a rangeland health assessment.

Rangeland health assessments are utilized to make a rapid determination of the ecological status of rangeland. We use range health terminology (healthy, healthy with problems, or unhealthy), to rank the ability of rangeland to perform certain ecological functions. These functions include: net primary production, maintenance of soil/site stability, capture and beneficial release of water, nutrient and energy cycling and plant species functional diversity. For a detailed description on how to assess rangeland health for various plant communities please refer to "*Rangeland Health Assessment for Grassland, Forest and Tame Pasture*" (Adams et al. 2003). A general range health category (Healthy, Healthy with problems, Unhealthy) has been added to each community type description, which can be used as a guide when doing range health assessments.

Range management objectives tend to favor the later stages of plant succession (late-seral to potential natural community (PNC) or good to excellent range condition) (Adams et al. 2003). Late seral plant communities tend to be superior in the efficient capture of solar energy, in cycling of organic matter and nutrients, in retaining moisture, in supporting wildlife habitat values and in providing the highest potential productivity for the site. In contrast, early seral stages represent plant communities with diminished ecological processes, which are less stable and more vulnerable to erosion and invasion by weeds and non-native species. They also have diminished resource values for livestock forage production, wildlife habitat and watershed protection (Adams et al. 2003). Healthy rangelands perform important ecological functions and provide a broader suite of goods and services. In most cases these late seral plant communities are used as reference range plant community (RPC), but sometimes management goals influence the choice of RPC (e.g. a cut block to be maintained as untimbered rangeland).

How to use the guide

Decide what category the community type is in. If it is in the **Native grass or Shrub categories** it will not have tree cover and be found on steep south facing slopes or moist lowland areas adjacent to streams and rivers. The predominant species will be native grasses, willow and bog birch. The community types described in the native grass and shrub category can be split into the **Banff and Jasper Mountain** (includes Banff and Jasper National Parks and the Ya Ha Tinda) ecodistricts and the **Blairmore and Morley Foothills** (includes Porcupine Hills, Whaleback and Castle) ecodistricts. The **Disturbed grassland** community types will resemble the native grassland community types, but will show signs of extensive grazing pressure. These community types will be dominated by grazing resistant species Kentucky bluegrass, clover and dandelion. A couple of moderately grazed community types with a predominant native species cover are also found in this category.

The **Deciduous category** will be plant communities dominated by deciduous tree species aspen and balsam poplar and the **Conifer category** will be plant communities dominated by subalpine fir, Engelmann or white spruce, lodgepole pine, limber pine, black spruce, larch or Douglas fir tree species. The **Mixedwood category** will contain communities that will have at least 50% of the total tree cover as conifer or deciduous. The **Cutblock category** contains the types that have had timber harvesting. Finally, new community types that were described in the Cypress Hills are outlined in the **Cypress Hills category** of the guide.

In order to understand how the community types in this guide are related to the ecosites and ecosite phases outlined in "Ecosites of Southwestern Alberta" (Archibald et al. 1996), the community types in this guide are arranged by ecological site and ecological site phase (Table 1). Table 1 is a reproduction of Figure 17 in the Ecosites of Southwestern Alberta guide with the community types in this guide highlighted in the reference range plant community type and grazing succession categories (Table 1). For the most part the ecological sites and ecological site phases are the same, particularly for the forested community types, but a number of new ecological sites and ecological site phases had to be created for the grass and shrubland community types (Table 1). The ecological sites included (aa)(subxeric/medium) bluebunch wheatgrass, (cc)(submesic/rich) rough fescue grassland, (g) meadow (subhygric/very rich), (h) horsetail (hygric/rich) and (ij) fen (subhydric/rich). The (g) meadow, (h) horsetail, and (ij) fen ecosites are similar to the (e) meadow, (f) horsetail and (g) fen ecosites found in the guide Ecosites of West-Central Alberta (Beckingham et al. 1996). The ecological site phases include (aa1) bluebunch wheatgrass, (aa2) big sagebrush, (b4) yellow mtn. avens, (b5) bearberry grassland, (c5) grassland, (cc1) rough fescue grassland, (d4) white meadowsweet Aw, (d5) shrubland, (d6) grassland (e4) shrubland, (g1) shrubland, (g2) grassland, (h2) horsetail Sw, (h3) horsetail shrubland, (ij1) treed fen, (ij2) shrubby fen and (ij3) graminoid fen. The "Grazing succession" category (Table 1) outlines the successionl sequence the community type will undergo with increased grazing pressure. A number of grazed ecological site phases were included here. These included: (aa1a) grazed grassland, (cc1a) grazed rough fescue, (d3a) cultivated Sw, (d4a) grazed Aw, (d5a) grazed shrubland, (e2a) grazed Aw, (f1a) grazed Pb, and (g1a) grazed shrubby meadow

Table 1. Ecosites, ecosite phases and plant community types for the Montane subregion (adapted from Archibald et al. 1996)(range plant community type and grazing succession communities are described in this guide, forested plant communities are outlined in guide to "Ecosites of Southwestern Alberta")

Ecosite	Ecosite Phase	Forested Plant Community Type	Range plant community type	Grazing succession
a limber pine/juniper (subxeric/poor)	a1 limber pine/juniper Fd-Pf	a1.1 Fd-Pf/juniper	E2 Pf-Fd/Juniper/Bearberry	
aa Bluebunch wheatgrass grassland (subxeric/medium)	aa1 grassland		B3 Bluebunch wheatgrass-Sedge A1 Fringed sage/Junegrass A2 Northern wheatgrass-Sheep fescue A3 Small leaved everlasting/Junegrass A4 Creeping juniper/N. wheatgrass-C. needlegrass A5 Little clubmoss/Richardson needlegrass	C6. Blunt sedge/Little clubmoss/Moss phlox C6a Little clubmoss/Sedge C8 Northern wheatgrass-K. bluegrass C13 Sedge-Junegrass-Bluebunch wheatgrass A6. Kentucky bluegrass-Junegrass/Dandelion
	aa2 Big sagebrush		B5. Big sagebrush/B. wheatgrass-Sedge B6 Saskatoon-Rose-Snowberry/Bearberry	

b bearberry (submesic/poor)	b1 bearberry P1	b1.1 P1/bearberry-juniper	E3 Pl/Bearberry-Juniper	
	b2 bearberry Aw	b2.1 Aw/bearberry	F1 Aw-Fd/Bearberry G1 Aw/Bearberry/Rough fescue	
	b3 bearberry Aw-Sw-Pl	b3.1 Aw-Sw-Pl/Bearberry	E4 Sw-Pl/Alder/Bearberry	
	b4 yellow mtn. avens		D1 Yellow Mtn. Avens-River alder/Low forb D2 Yellow Mtn. Avens/Junegrass F2 Sw-Pl-Pb/Yellow Mtn. avens	
	b5 bearberry grassland		A7. Bearberry-Juniper	
cCanada buffalo-berry/ hairy wild rye (submesic/medium)	c1 Canada buffalo-berry/hairy wild rye Fd	c1.1 Fd/needle litter	E6a Fd/Needle litter	
		c1.2 Fd/hairy wild rye	E6 Fd/Hairy wildrye	
	c2 Canada buffalo-berry/hairy wild rye P1	c2.1 P1/Canada buffalo-berry/hairy wild rye	E5 Pl/Buffaloberry/Pinegrass E7 Pl/Dwarf bilberry/Hairy wildrye	
	c3 Canada buffalo-berry/hairy wild rye Aw	c3.1 Aw/hairy wild rye	F3 Aw-Pl/Buffaloberry/Hairy wildrye G2 Aw/Rose/Hairy wildrye G3 Aw/Hairy wildrye	
	c4 Canada buffalo-berry/hairy rye Aw-Sw-P1-Fd	c4.1 Aw-Sw-P1-Fd/hairy wild rye	F5 Aw-Sw/Blueberry	

	c5 grassland		B2 Idaho fescue-Parry oatgrass-Rough fescue B4 Rough fescue-Sedge/Bearberry E1 Pf/Rough fescue I1 Foothills rough fescue-Western porcupine grass	C1a Sedge-Parry oatgrass-Idaho fescue
cc Rough fescue grassland (submesic/rich)	cc1 Rough fescue		A11. Rough fescue-Fringed brome-Sedge A12. Rough fescue-Sedge-Junegrass B1 Rough fescue-Idaho fescue-Parry oatgrass B15 Rough fescue-Hairy wildrye I2 Shrubby cinquefoil/Foothills rough fescue-Intermediate oatgrass I4 Shrubby cinquefoil/Foothills rough fescue-Idaho fescue **Forest succession** B8 Fd/I.fescue-R.fescue B9 Fd/I.fescue-S.bluegrass B10 Aw/Strawberry/R. fescue A8 Prickly rose-Snowberry	A13. Sedge-Junegrass C1 I. fescue-P.oatgrass-Sedge C2 C. bluegrass-R. fescue C3 K. bluegrass-R. fescue C4 K.bluegrass-Timothy/Dandelion C5 S. brome-K.bluegrass C8 C. red fescue/Dandelion-Clover C9 R.fescue-K.bluegrass C10 R.fescue-Sedge-Mtn. brome I3 Shrubby cinquefoil/ Foothills R. fescue/Golden bean
d creeping mahonia-white meadowsweet (mesic/medium)	d1 creeping mahonia-white meadowsweet Fd	d1.1 Fd/feather moss		E6b Fd/Timothy
		d1.2 Fd/white meadowsweet	E10 Sw-Fd/White meadowsweet E10a Fd/Snowberry F4a Fd-Aw/Pinegrass F6 Aw-Fd/White meadowsweet	

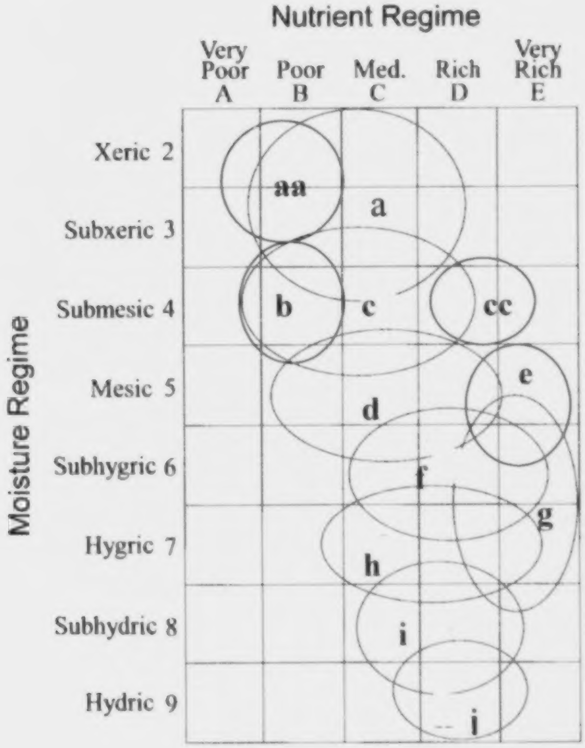
	d2 creeping mahonia-white meadowsweet P1	d2.1 P1/green alder		
		d2.2 P1/creeping mahonia-white meadowsweet	E8 Pl/White meadowsweet	
		d2.3 P1/pine grass	E9 Pl/Pinegrass F4 Aw-Pl/Pinegrass	
		d2.4 P1/mountain lover/bear grass		
		d2.5 P1/feather moss	E11 Pl/Moss I7 Pl-Aw/Bunchberry/Moss	
	d3 creeping mahonia-white meadowsweet Sw	d3.1 Sw/feather moss	E12 Sw/Moss	A14 Creeping red fescue-Timothy
	d4 white meadowsweet Aw		G4 Aw/White meadowsweet/Pinegrass G5 Aw/Rose/Pinegrass	G6 Aw/Pinegrass-K. bluegrass C12 Aw/Orchardgrass-K. bluegrass
	d5 shrubland		A10. Bog birch-Sedge-Rough fescue B6a Snowberry-Rose-Saskatoon	B16 Big sagebrush-Buckthorn/K. bluegrass C11Snowberry/K. bluegrass I5 Snowberry/K. Bluegrass-Timothy I6 Silverberry/K. bluegrass
	d6 pinegrass grassland		B7 Pinegrass-Hairy wildrye/Strawberry	

e thimbleberry/pine grass (mesic/rich)	e1 thimbleberry/pine grass Pl	e1.1 Pl/thimbleberry	E13 Pl/Thimble berry E14 Pl/Thimbleberry/Beargrass E15 Pl/River alder/Thimbleberry	
	e2 thimbleberry/pine grass Aw	e2.1 Aw/thimbleberry	G10 Aw/Thimbleberry G11 Aw/Cow parsnip	
		e2.2 Aw/pine grass	F7 Aw-Pb-Sw/Pinegrass	G7 Aw/Timothy-K. bluegrass
		e2.3 Aw/saskatoon-snowberry	F8 Aw-Fa/Snowberry/Pinegrass G8 Aw/Snowberry-Saskatoon	F9 Pl-Aw/Snowberry/K. bluegrass F10 Aw-Fa-Se/Timothy G9 Aw/Snowberry/K. bluegrass
	e3 thimbleberry/pine grass Sw	e3.1 Sw/thimbleberry	E16 Sw/Thimbleberry	
	e4 shrubland		B11 Thimbleberry brush B14 Forb meadows	D14 Hawthorn-Snowberry/Kentucky bluegrass
f balsam poplar (subhygric/rich)	fl balsam poplar Pb	fl.1 Pb/snowberry	F11 Spruce-Pb/Snowberry G12 Pb/Thimbleberry G15 Aw/Birch-Willow	G13 Pb/Cow parsnip/K. bluegrass G14 Pb/Snowberry/Kentucky bluegrass

g meadow (subhygric/very rich)	g1 shrubby meadow		D3 Bebb willow/Hairy wildrye D5 G.alder-S.willow-Raspberry D10 Dwarf birch-S.cinquefoil/Valerian/Sedge D13 Water birch-Smooth willow/Pinegrass	D6 Flat lv'd willow/Quackgrass-K. bluegrass D4 Bebb willow/Kentucky bluegrass
	g2 grassy meadow		B13 Tufted hairgrass-Baltic rush A9 Tufted hairgrass-Sedge	B13a Baltic rush
h horsetail (hygric/rich)	h1 horsetail Sw-Pb			
	h2 horsetail Sw		F12 Sw-Aw/Scouring rush E12a Sw/Horsetail E12b Sw/Silverberry/Horsetail	
	h3 horsetail shrubland		D7 Flat lv'd willow/Horsetail/Sedge	
ij fen (subhydric/rich)	ij1 treed fen		E17 Sb-Lt/Labrador tea D12 Sb/Willow/Wire rush-Sedge/Moss	
	ij2 shrubby fen		D2a Drummond's willow D3a Bebb willow/Beaked sedge D8 Mrytle lv'd willow/Sedge D9 Basket willow/Sedge D11 Sw/Willow/Water sedge/Golden moss	D9a Basket willow/ Kentucky bluegrass

	ij3 graminoid fen		B12 Beaked-Water Sedge B12a Awned sedge B17 Creeping spike rush B18 Small fruited bulrush B19 Great bulrush B20 Cattail	

Figure 2. Edatopic grid for the Montane subregion


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
aa
a
b
c
cc
e
d
f
g
h
i
j

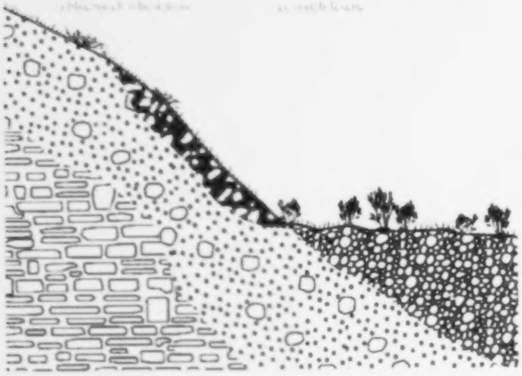
Ecological sites

a limber pine/juniper
(subxeric/poor)
aa bluebunch wheatgrass grassland
(subxeric/medium)
b bearberry
(submesic/poor)
c Canada buffaloberry/ hairy wildrye
(submesic/medium)
cc rough fescue
(submesic/rich)
d creeping mahonia-white meadowsweet
(mesic/medium)
e thimbleberry/pinegrass
(mesic/rich)
f balsam poplar
(subhygric/rich)
g meadow
(subhygric/very rich)
h horsetail
(hygric/rich)
ij fen
(subhydric/rich)

aa Bluebunch wheatgrass (n=104) subxeric/medium

GENERAL DESCRIPTION

This ecosite is located on steep, south and west facing slopes throughout the Blairmore and Morley Foothills ecodistricts and the Banff and Jasper Mountain ecodistricts. The soils are poorly developed, nutrient poor and generally have xeric or subxeric moisture regimes. The grassland communities of the Banff and Jasper Mountain ecodistricts are often dominated by northern wheatgrass, junegrass, fringed sage, sheep fescue and upland sedge species. In contrast the Blairmore and Morley foothills ecodistricts are often dominated by bluebunch wheatgrass. Big sagebrush dominated communities are also found in isolated areas in the South Castle in this ecosite.



SUCCESSIONAL RELATIONSHIPS

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs such as saskatoon, snowberry and chokecherry, often invade the site with succession to Douglas fir. Heavy grazing pressure on the grasslands can often lead to a degraded site that is dominated by fringed sage, sedge, and little clubmoss. However, on moister sites timothy and Kentucky bluegrass can often invade into this ecosite

INDICATOR SPECIES

Rose
Saskatoon
Bearberry
Little clubmoss
Sedge
Junegrass
Timothy
Chokecherry
Fringed sage
Small lv'd everlasting
Northern wheatgrass
Sheep fescue
Bluebunch wheatgrass
Big sagebrush

SITE CHARACTERISTICS

Moisture regime: xeric, subxeric, submesic
Nutrient regime: poor, medium
Topographic position: crest, upper, mid
Slope: (16-30%) (31-45%)(45-70%)
Aspect: south, southwest, west

SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: CL,SiL
Effective texture: CL, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C,M
Soil subgroup: O.EB, O.R

ECOSITE PHASES

aa1 grassland (n=42)
aa1a grazed grassland (n=9)
aa2 big sagebrush (n=4)

aa1 grassland (n=44)

CHARACTERISTIC SPECIES

Shrub

[3]	Saskatoon*
[3]	Rose
[3]	Snowberry
[1]	Chokecherry
[2]	Bearberry
[5]	Fringed sage*
[1]	Shrubby cinquefoil
[3]	Juniper

Forb

[1]	Wild blue flax
[2]	Small lv'd everlasting
[2]	Yarrow
[1]	Silky perennial lupine
[2]	Little clubmoss

Grasses

[9]	Sedge species
[1]	Sheep fescue
[6]	Bluebunch wheatgrass*
[1]	Timothy
[13]	Northern wheatgrass*
[8]	Junegrass*
[2]	Hairy wildrye
[2]	Rough fescue
[1]	Richardson needlegrass

SITE CHARACTERISTICS

Moisture regime: xeric, subxeric, submesic
Nutrient regime: poor, medium, rich
Topographic position: crest, upper slope, midslope
Slope:(16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: CL, SiL
Effective texture: CL, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C,M, E
Soil subgroup: O.R, O.EB

RANGE PLANT COMMUNITY TYPES

A1 Fringed sage/Junegrass (n=11)
A2 Northern wheatgrass-Sheep fescue (n=2)
A3 Small lv'd everlasting/Junegrass (n=2)
A4 Creeping juniper/Northern wheatgrass-Columbia needlegrass (n=2)
A5 Little clubmoss/Richardson needlegrass (n=1)
B3 Bluebunch wheatgrass-Sedge (n=26)

aa1a Grazed grassland (n=25)

CHARACTERISTIC SPECIES

Shrub

[1]	Shrubby cinquefoil
[1]	Creeping juniper
[4]	Snowberry
[2]	Rose
[2]	Fringed sage*
[1]	Bearberry

Forb

[2]	Showy locoweed
[1]	Late yellow locoweed
[3]	Small leaved everlasting
[2]	Low goldenrod
[8]	Little clubmoss*
[4]	Moss phlox
[6]	Dandelion*

Grasses

[7]	Junegrass
[13]	Northern wheatgrass
[7]	Sedge
[15]	Kentucky bluegrass*
[1]	Rough fescue
[3]	Parry oatgrass

SITE CHARACTERISTICS

Moisture regime:, xeric, subxeric, submesic
Nutrient regime: poor, medium
Topographic position: crest, upper slope, midslope
Slope: (16-30%) (31-45%)(45-70%)
Aspect: westerly, southrly

SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: SiL, CL
Effective texture: C, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C, M
Soil subgroup: O.R, O.EB

RANGE PLANT COMMUNITY TYPES

A6 Kentucky bluegrass-Junegrass/Dandelion (n=3)
C6 Blunt sedge/Little clubmoss-Moss phlox(n=5)
C8 Northern wheatgrass-Kentucky bluegrass(n=1)
C6a Little clubmoss/Sedge (n=8)
C13 Sedge-Junegrass-Bluebunch wheatgrass (n=8)

aa2 **big sagebrush** (n=36)

CHARACTERISTIC SPECIES

Shrub

[21]	Big sagebrush*
[1]	Snowberry
[1]	Rose
[9]	Saskatoon
[22]	Bearberry*

Forb

[3]	Yarrow
[2]	Silky perennial lupine
[1]	Small leaved everlasting
[1]	Low goldenrod
[5]	Little clubmoss*
[3]	Wild bergamont
[2]	Smooth aster

Grasses

[3]	Junegrass
[5]	Bluebunch wheatgrass*
[1]	Sedge
[8]	Idaho fescue
[1]	Rough fescue
[4]	California oatgrass

SITE CHARACTERISTICS

Moisture regime:, xeric, subxeric, submesic
Nutrient regime: poor, medium
Topographic position: crest, upper slope, midslope
Slope: (16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: SiL, CL
Effective texture: C, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C, M
Soil subgroup: O.R

RANGE PLANT COMMUNITY TYPES

B5 Big sagebrush/Bluebunch wheatgrass-Sedge (n=4)
B6 Saskatoon-Rose-Snowberry/Bearberry (n=32)

b4 yellow mountain avens (n=4)

CHARACTERISTIC SPECIES

Trees

[7] Balsam poplar*
[14] White spruce

Shrub

[24] Yellow mountain avens*
[2] Silverberry*
[1] Shrubby cinquefoil
[2] Buffaloberry
[1] Bearberry

Forb

[2] Yarrow
[2] Lindley's aster
[1] Cut leaved anemone
[1] Showy locoweed

Grasses

[7] Junegrass
[1] Sedge
[1] Canada bluegrass

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: poor, medium
Topographic position: level
Slope: (0-2%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: no data
Surface texture: S
Effective texture: S
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F
Soil subgroup: O.R

RANGE PLANT COMMUNITY TYPES

D1 Yellow mtn. avens-River alder/Low forb(n=1)
D2 Yellow mtn. avens/Junegrass (n=2)
F2 Sw-Pl-Pb/Yellow mtn. avens (n=1)

b5 bearberry grassland (n=17)

CHARACTERISTIC SPECIES

Shrub

[1]	Juniper spp.
[3]	Rose
[1]	Shrubby cinquefoil
[2]	Snowberry
[3]	Saskatoon
[24]	Bearberry*

Forb

[1]	Yarrow
[1]	Lindley's aster
[1]	Cut leaved anemone
[1]	Showy locoweed
[1]	Small leaved everlasting*
[2]	Strawberry

Grasses

[2]	Junegrass
[2]	Northern wheatgrass
[2]	Rough fescue
[2]	Hairy wildrye

SITE CHARACTERISTICS

Moisture regime: subxeric, submesic, mesic
Nutrient regime: poor, medium
Topographic position: crest, upper slope, midslope
Slope:(0-2%)(16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-5)(6-15)
Humus form: no data
Surface texture: L
Effective texture: L
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C, M
Soil subgroup: O.R, O.EB

RANGE PLANT COMMUNITY TYPES

A7 Bearberry/Juniper (n=17)

c5 grassland (n=111)

CHARACTERISTIC SPECIES

Trees

[2]	Limber pine

Shrub

[2]	Saskatoon
[2]	Rose
[1]	Snowberry
[15]	Bearberry*
[1]	Fringed sage
[2]	Shrubby cinquefoil
[1]	Juniper

Forb

[2]	Strawberry
[2]	Old mans whisker's
[3]	Cut leaved anemone
[1]	Woolly gromwell
[1]	Yarrow
[2]	Silky perennial lupine
[1]	Little clubmoss

Grasses

[3]	Sedge species
[17]	Rough fescue
[11]	Idaho fescue*
[1]	Slender wheatgrass
[11]	Parry oatgrass*
[2]	Junegrass*

SITE CHARACTERISTICS

Moisture regime: subxeric, submesic
Nutrient regime: medium, rich
Topographic position: crest, upper slope, midslope
Slope:(0-2%) (16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L
Effective texture: CL, SiCL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C,M,T
Soil subgroup: O.MB

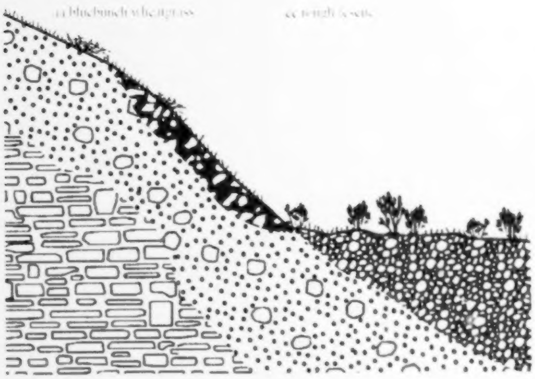
RANGE PLANT COMMUNITY TYPES

B2 Idaho fescue-Parry oatgrass-Rough fescue(n=52)
B4 Rough fescue-Sedge/Bearberry (n=48)
E1 Pf/Rough fescue (n=1)
I1 Foothills fescue-Western Porcupine grass (n=10)

cc rough fescue grassland (n=430)

GENERAL DESCRIPTION

This ecosite is typical of south and west facing slopes and lower slope positions throughout the Montane subregion from an elevation of 1300 m to 1900 m. This ecosite is usually dominated by grass species because of the dry site conditions and westerly winds. The soils of this ecosite are dominated by deep black chernozemic soils. A number of rough fescue dominated sites have not had the species composition change in over 30 years of no disturbance indicating the climax nature of this ecosite in the Montane subregion.



SUCCESSIONAL RELATIONSHIPS

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs and trees such as saskatoon, snowberry, chokecherry and aspen often invade the site with succession to Douglas fir and Lodgepole pine. Heavy grazing pressure on these grasslands can often lead to a degraded site that is dominated by Kentucky bluegrass, timothy and clover species. Many sites within this ecosite have been cultivated and are dominated by cereal crops and smooth brome.

INDICATOR SPECIES

Shrubby cinquefoil
Old mans whisker's
Sticky purple geranium
Woolly gromwell
Junegrass
Bearberry
Cut leaved anemone
Mountain shooting star
Rough fescue
Idaho fescue
Parry oatgrass
Kentucky bluegrass
Slender wheatgrass
Timothy

submesic/rich

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: rich, medium
Topographic position: crest, midslope, lower slope
Slope: (0-2%)^5(16-30%)^3 (31-45%)^1(45-70%)^1
Aspect: south, southwest, west

SOIL CHARACTERISTICS

Organic thickness: (0-2)(2-5)
Humus form: mull
Surface texture: CL,SiL, L
Effective texture: CL, SiL, SL,
Depth to Mottles/Gley: none
Drainage: well
Parent material: F, GF, M
Soil subgroup: O.BL, O.DG, O.MB

ECOSITE PHASES

cc1 rough fescue (n=168)
cc1a grazed rough fescue (n=262)

cc1 rough fescue (n=168)

CHARACTERISTIC SPECIES

Shrub

[3]	Snowberry
[1]	Saskatoon
[1]	Rose
[3]	Shrubby cinquefoil
[1]	Juniper

Forb

[3]	Strawberry
[4]	Old mans whisker's
[2]	Cut leaved anemone
[1]	Woolly gromwell
[2]	Yarrow
[2]	Silky perennial lupine
[3]	Yellow beardtongue
[1]	Shooting star

Grasses

[5]	Sedge species
[29]	Rough fescue*
[9]	Idaho fescue*
[2]	Slender wheatgrass
[10]	Parry oatgrass*
[2]	Junegrass
[1]	Fringed brome

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: medium, rich
Topographic position: level, midslope, lower slope
Slope:(0-2%)^4 (16-30%)^3 (31-45%)^1(45-70%)^1
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.MB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

A8 Prickly rose-Snowberry (n=6)
A11 Rough fescue-Fringed brome-Sedge (n=5)
A12 Rough fescue-Sedge-Junegrass (n=2)
B1 Rough fescue-Idaho fescue-Parry oatgrass (n=102)
B8 Fd/I.fescue-Rough fescue (n=5)
B9 Fd/Idaho fescue-Sandberg bluegrass(n=1)
B10 Aw/Strawberry/Rough fescue (n=2)
B15 Rough fescue-Hairy wildrye (n=2)
I2 Shrubby cinquefoil/Foothills rough fescue-Intermediate oatgrass (n=37)
I4 Shrubby cinquefoil/Foothills rough fescue-Idaho fescue (n=6)

cc1a grazed rough fescue (n=262)

CHARACTERISTIC SPECIES

Shrub

[1]	Rose
[3]	Shrubby cinquefoil

Forb

[2]	Strawberry
[10]	Old mans whisker's
[2]	Cut leaved anemone
[5]	Yarrow
[10]	Dandelion
[3]	Yellow beardtongue
[3]	Shooting star
[5]	Graceful cinquefoil

Grasses

[5]	Sedge species
[12]	Rough fescue*
[15]	Idaho fescue*
[20]	Kentucky bluegrass*
[10]	Parry oatgrass*
[12]	Timothy*
[2]	Canada bluegrass

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: medium, rich
Topographic position: level, midslope, lower slope
Slope:(0-2%)^{4} (16-30%)^{3} (31-45%)^{1}(45-70%)^{1}
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.MB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

A13 Sedge-Junegrass (n=2)
C1 Idaho fescue-Parry oatgrass-Sedge (n=32)
C2 Canada bluegrass-Rough fescue (n=14)
C3 Kentucky bluegrass-Rough fescue(n=70)
C4 Kentucky bluegrass-Timothy/Dandelion (n=74)
C5 Smooth brome-Kentucky bluegrass (n=14)
C7 Creeping red fescue/Dandelion-Clover (n=10)
C9 Rough fescue-Kentucky bluegrass (n=28)
C10 Rough fescue-Sedge-Mountain brome (n=2)
I3 Shrubby cinquefoil/Foothills rough fescue-Golden bean (n=17)

d3a cultivated hairy wildrye Sw (n=2)

CHARACTERISTIC SPECIES

Shrub

[2]	Willow spp.

Forb

[2]	Fireweed
[1]	Tall larkspur

Grasses

[6]	Sedge species
[2]	Kentucky bluegrass*
[18]	Creeping red fescue*
[10]	Hairy wildrye
[8]	Timothy*

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: medium, poor
Topographic position: midslope, upper slope
Slope:[3] (31-45%)(45-70%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (0-5-2)(2-5))
Humus form: mor
Surface texture: SiL, L, CL
Effective texture: L, SiL
Depth to Mottles/Gley: none
Drainage: well
Parent material: F, M
Soil subgroup: O.EB

RANGE PLANT COMMUNITY TYPES

A14 Creeping red fescue-Timothy (n=2)

d4 white meadowsweet Aw (n=47)

Trees

[47]	Aspen
[2]	Lodgepole pine

Shrub

[9]	White meadowsweet
[6]	Rose

Forb

[6]	Showy aster
[8]	Strawberry
[5]	Yellow peavine
[2]	Northern bedstraw
[4]	Lindley's aster

Grasses

[19]	Pinegrass
[1]	Sedge
[5]	Hairy wildrye

SITE CHARACTERISTICS

Moisture regime: mesic
Nutrient regime: medium, poor, rich
Topographic position: midslope, lower slope
Slope: (0-5%)(10-25%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor
Surface texture: SiL, L, SL
Effective texture: L, SCL, SiCL, SL, SiL
Depth to Mottles/Gley: none (26-50)
Drainage: well, mod. well
Parent material: X, M, GF
Soil subgroup: O.EB, E.EB, O.GL

RANGE PLANT COMMUNITY TYPES

G4 Aw/White meadowsweet/Pinegrass (n=12)
G5 Aw/Rose/Pinegrass (n=35)

d4a grazed Aw (n=6)

CHARACTERISTIC SPECIES

Trees

[21]	Aspen

Shrub

[8]	Wild red raspberry
[8]	Rose

Forb

[6]	Smooth aster
[7]	Strawberry
[6]	Yellow peavine
[10]	Wild white geranium
[3]	Dandelion

Grasses

[22]	Pinegrass
[23]	Kentucky bluegrass
[3]	Hairy wildrye
[10]	Orchardgrass

SITE CHARACTERISTICS

Moisture regime: mesic
Nutrient regime: medium
Topographic position: lower slope
Slope: (3-23%)
Aspect: southerly

SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor
Surface texture: SiL, L, SL
Effective texture: L, SCL, SiCL, SL, SiL
Depth to Mottles/Gley: none (26-50)
Drainage: well, mod. well
Parent material: X, M, GF

Soil subgroup: O.EB, E.EB, O.GL

RANGE PLANT COMMUNITY TYPES

G6 Aw/Pinegrass-Kentucky bluegrass(n=4)
C12 Aw/Orchardgrass-Kentucky bluegrass (n=2)

d5 shrubland (n=59)

CHARACTERISTIC SPECIES

Shrub

[30]	Bog birch
[7]	Shrubby cinquefoil

Forb

[3]	Yarrow
[2]	Small leaved everlasting
[4]	Cut leaved anemone
[4]	Heart leaved Alexander
[3]	Old mans whisker's
[3]	American vetch

Grasses

[12]	Sedge
[2]	Rough fescue
[4]	Sheep fescue
[3]	Junegrass

SITE CHARACTERISTICS

Moisture regime: mesic
Nutrient regime: medium
Topographic position: lowerslope
Slope: (0-2)
Aspect: southerly

SOIL CHARACTERISTICS

Organic thickness: (0-5)(2-5)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: L, SiL
Depth to Mottles/Gley: none
Drainage: well
Parent material: F,
Soil subgroup: O.EB

RANGE PLANT COMMUNITY TYPES

A10 Bog birch/Sedge-Rough fescue (n=1)
B6 Snowberry-Rose-Saskatoon/Bearberry (n=58)

d5a grazed shrubland (n=24)

CHARACTERISTIC SPECIES

Shrub

[19]	Big sagebrush
[18]	Snowberry
[7]	Buckthorn

Forb

[6]	Strawberry
[20]	Yellow beardstongue
[5]	Yarrow
[3]	Dandelion
[2]	Star flowered solomon's seal
[1]	American vetch

Grasses

[1]	Sedge species
[25]	Kentucky bluegrass*
[6]	Timothy*

SITE CHARACTERISTICS

Moisture regime: mesic, subhygric
Nutrient regime: medium, rich
Topographic position: level, lower slope
Slope:(1-10%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.MB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

B16 Big sagebruch-Buckthorn/Kentucky bluegrass (n=2)
C11 Snowberry/Kentucky bluegrass (n=3)
I5 Snowberry/Kentucky bluegrass (n=18)
I6 Silverberry/Kentucky bluegrass (n=1)

d6 pinegrass grassland (n=11)

CHARACTERISTIC SPECIES

Shrub

[2] Snowberry
[2] Rose
[2] White meadowsweet

Forb

[13] Strawberry
[4] Yellow peavine
[5] Silky perennial lupine
[5] Showy aster

Grasses

[23] Pinegrass
[7] Hairy wildrye
[1] Northern awnless brome

SITE CHARACTERISTICS

Moisture regime: mesic, subhygric
Nutrient regime: medium, rich
Topographic position: level, mid slope, lower slope
Slope:(0-46%)
Aspect: northerly^5, westerly^4, southerly^1

SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.EB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

B7 Pinegrass-Hairy wildrye/Strawberry (n=11)

e2a **grazed aspen** (n=18)

CHARACTERISTIC SPECIES

Trees

[60]	Aspen
[9]	Lodgepole pine

Shrub

[3]	Rose
[30]	Snowberry
[5]	Thimbleberry
[2]	Saskatoon

Forb

[8]	Strawberry
[5]	Clover
[5]	Smooth aster
[20]	Dandelion
[8]	Wild white geranium
[2]	American vetch
[2]	Veiny meadow rue

Grasses

[2]	Mountain brome
[20]	Kentucky bluegrass*
[18]	Timothy*
[4]	Pinegrass

SITE CHARACTERISTICS

Moisture regime: mesic^{9}, submesic^{1}
Nutrient regime: medium^{8}, rich^{2}
Topographic position: level, lower slope
Slope:(0-4%)^{8}(20-26%)^{2}
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-5)(6-15)
Humus form: mor
Surface texture: L, SL, CL
Effective texture: CL, SCL, L
Depth to Mottles/Gley: none
Drainage: mod.well, well
Parent material: F, GF, M
Soil subgroup: O.EB, O.BL, CU.R, O.DG, O.MB

RANGE PLANT COMMUNITY TYPES

G7 Aw/Timothy-Kentucky bluegrass (n=13)
G9 Aw/Snowberry/Kentucky bluegrass (n=2)
F9 Pl-Aw/Snowberry/Kentucky bluegrass (n=1)
F10 Aw-Fa-Se/Timothy (n=2)

e4 shrubland (n=7)

CHARACTERISTIC SPECIES

Shrub

[1]	Rose
[8]	Snowberry
[30]	Thimbleberry
[5]	Hawthorn

Forb

[8]	Strawberry
[6]	Lindleys aster
[4]	Showy aster
[2]	Fireweed
[2]	Baneberry
[2]	Yellow peavine
[8]	Wild bergamont
[3]	Star flowered solomon seal

Grasses

[2]	Rough fescue
[1]	Fringed brome
[3]	Idaho fescue
[4]	Pinegrass
[2]	Parry oatgrass
[2]	Slender wheatgrass

SITE CHARACTERISTICS

Moisture regime: mesic^5, subhygric^5
Nutrient regime: medium^2, rich^8
Topographic position: level, lower slope, midslope
Slope:(0-4%)^8(20-26%)^2(35-47)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (0-5)(6-15)
Humus form: mor, raw moder
Surface texture: L, SL, CL
Effective texture: CL, SiCL, SC L
Depth to Mottles/Gley: none
Drainage: mod.well, well
Parent material: F, M
Soil subgroup: O.GL, O.EB, O.B

RANGE PLANT COMMUNITY TYPES

B11 Thimbleberry brush (n=3)
B13 Forb meadows (n=2)
D14 Hawthorn-Snowberry/Kentucky bluegrass (n=2)

f1a grazed balsam poplar (n=14)

CHARACTERISTIC SPECIES

Trees

[75]	Balsam poplar

Shrub

[5]	Rose
[9]	Sticky currant

Forb

[26]	Showy aster
[8]	Cow parsnip
[25]	Canada violet
[11]	Sweet cicely
[6]	Veiny meadow rue

Grasses

[11]	Sedge
[10]	Kentucky bluegrass*

SITE CHARACTERISTICS

Moisture regime: subhygric
Nutrient regime: rich
Topographic position: level, lower slope
Slope:(0-3%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-5)
Humus form: moder
Surface texture: L,
Effective texture: CL
Depth to Mottles/Gley: none
Drainage: mod.well,
Parent material: GF
Soil subgroup: not available

RANGE PLANT COMMUNITY TYPES

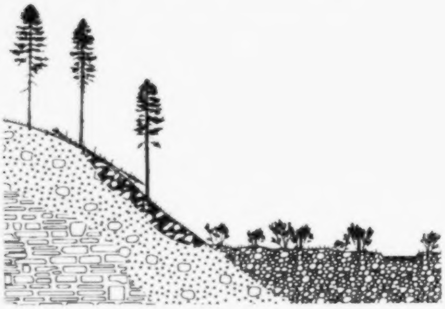
G13 Pb/Cow parsnip/Kentucky bluegrass (n=1)
G14 Pb/Snowberry/Kentucky bluegrass (n=12)

g meadow (n=22)(taken from Ecosites of West-Central Alberta)

subhygric/very rich

GENERAL DESCRIPTION

The meadow ecosite tends to be mesic to subhygric and occurs on fluvial parent materials where flooding and/or high water tables increase soil water content and replenish nutrients. The soils on these sites tend to have thick Ah horizons and loamy textures.



SUCCESSIONAL RELATIONSHIPS

The meadow ecosite is successional stable. Disturbance regime, cold air drainage, and competition from a diverse cover of shrubs, forbs and grasses slow or inhibit the establishment of trees. If trees become established, the rich, moist loamy soils are conducive to rapid growth.

INDICATOR SPECIES

Willow
Veiny meadow rue
Tufted hairgrass
Slender wheatgrass
Cow parsnip
Avens
Marsh reedgrass
Sedge

SITE CHARACTERISTICS

Moisture regime: subhydric, hygric,mesic
Nutrient regime: rich, very rich, medium
Topographic position: level, depression, toe
Slope: level, (2-5%)
Aspect: level, southerly, easterly

SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL, SiL, SL, SCL
Effective texture: SiC, SiCL, SiL, SL, SCL, L
Depth to Mottles/Gley: (0-25),(51-100),none,(26-50)
Drainage: imperfect, poor, mod. well, well
Parent material: F,
Soil subgroup:R.HG, O.R, GLCU.R, CU.HR

ECOSITE PHASES

g1 shrubby meadow (n=7)
g1a grazed shrubby meadow (n=11)
g2 grassy meadow (n=4)

g1 shrubby meadow (n=7)

CHARACTERISTIC SPECIES

Shrub

[14]	Green alder
[8]	Bog birch
[27]	Willow
[9]	Raspberry

Forb

[1]	Strawberry
[1]	Fireweed
[5]	Stinging nettle
[2]	Marsh valerian

Grasses

[11]	Sedge
[4]	Hairy wildrye
[4]	Tufted hairgrass
[4]	Timothy

SITE CHARACTERISTICS

Moisture regime: mesic, subhygric
Nutrient regime: medium, rich
Topographic position: level, mid slope, lower slope
Slope:(0-5%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL, SiL, SL, SCL
Effective texture: SiC, SiCL, SiL, SL, SCL, L
Depth to Mottles/Gley: (0-25),(51-100),none,(26-50)
Drainage: imperfect, poor, mod. well, well
Parent material: F,
Soil subgroup:R.HG, O.R, GLCU.R, CU.HR

RANGE PLANT COMMUNITY TYPES

D3 Bebb willow/Hairy wildrye (n=2)
D5 Green alder-Scoulers willow-Raspberry(n=2)
D10 Dwarf birch-Shrubby cinquefoil/Marsh valerian/Sedge (n=2)
D13 Water birch-Smooth willow/Pinegrass(n=1)

g1a grazed shrubby meadow (n=11)

CHARACTERISTIC SPECIES

Shrub

[15]	Flat leaved willow
[1]	Bog birch
[25]	Bebb willow

Forb

[3]	Marsh violet
[2]	Rush aster

Grasses

[6]	Sedge
[27]	Kentucky bluegrass
[18]	Quackgrass
[4]	Alpine rush

SITE CHARACTERISTICS

Moisture regime. mesic, hygric
Nutrient regime: medium, rich
Topographic position: level, mid slope, lower slope
Slope:(0-2%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL,
Effective texture: SiC, SiCL,
Depth to Mottles/Gley: not available
Drainage: poor, well
Parent material: F,
Soil subgroup:R.HG, O.R,

RANGE PLANT COMMUNITY TYPES

D4 Bebb willow/Kentucky bluegrass (n=9)
D6 Flat leaved willow/Quackgrass-Kentucky bluegrass(n=2)

g2 grassy meadow (n=4)

CHARACTERISTIC SPECIES

Shrub

[10]	Shrubby cinquefoil

Forb

[10]	Old mans whisker's
[4]	Veiny meadow
[12]	Graceful cinquefoil
[2]	Yellow beardstongue

Grasses

[25]	Sedge
[2]	Hairy wildrye
[20]	Tufted hairgrass
[6]	Slender wheatgrass
[12]	Baltic rush

SITE CHARACTERISTICS

Moisture regime: hygric, subhygric
Nutrient regime: rich
Topographic position: level, lower slope
Slope:(0-5%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL, SiL, SL, SCL
Effective texture: SiC, SiCL, SiL, SL, SCL, L
Depth to Mottles/Gley: (0-25),(51-100),none,(26-50)
Drainage: imperfect, poor, mod. well, well
Parent material: F,
Soil subgroup:R.HG, O.R, GLCU.R, CU.HR

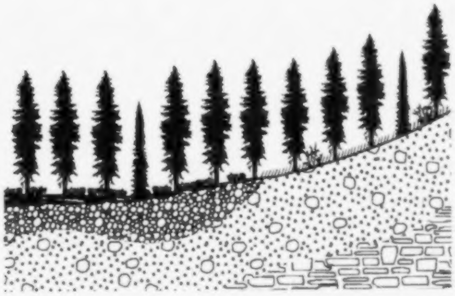
RANGE PLANT COMMUNITY TYPES

A9 Tufted hairgrass-Sedge(n=1)
B13 Tufted hairgrass-Baltic rush (n=2)
B13a Baltic rush (n=1)

h horsetail (n=12)(taken from Ecosites of West-Central Alberta)

GENERAL DESCRIPTION

The horsetail ecosite is wet and nutrient rich. These sites are commonly found on toe and lower slope positions with fluvial parent materials where flooding or seepage periodically replenishes the substrate nutrient availability. With wet soils gleysolic soils are common and organic matter tends to accumulate. Mottles were within 25 cm of the soil surface in over 80% of the sites. Horsetails commonly form a blanket over the forest floor.



SUCCESSIONAL RELATIONSHIPS

Balsam poplar is a pioneer species on this ecosite. White spruce is the expected climax species, however its establishment may be slow due to high vegetation cover.

INDICATOR SPECIES

Meadow horsetail
Common horsetail
White spruce
Black spruce
Balsam poplar
Aspen
Willow

hygric/rich

SITE CHARACTERISTICS

Moisture regime: subhygric, hygric
Nutrient regime: rich, very rich
Topographic position: level, depression, toe
Slope: level, (0-1%)
Aspect: level, southerly, easterly

SOIL CHARACTERISTICS

Organic thickness: (26-39)(60-79)(16-25))
Humus form: moder, peaty mor
Surface texture: mesic, SiL, SiC, Si
Effective texture: humic, SiL, SiC, Si
Depth to Mottles/Gley: (0-25)
Drainage: imperfect, poor, mod. well, well
Parent material: F, FL, E
Soil subgroup:R.HG, O.R, GLCU.R, GL.R

ECOSITE PHASES

h2 horsetail Sw (n=6)
h3 horsetail shrubland (n=6)

h2 horsetail Sw (n=6)

CHARACTERISTIC SPECIES

Trees

[60]	White spruce
[15]	Aspen
[10]	Balsam poplar

Shrub

[3]	Rose
[5]	Silverberry

Forb

[4]	Dandelion
[5]	Dwarf scouring rush
[20]	Horsetail
[4]	Lindley's aster
[1]	American vetch

Grasses

[7]	Kentucky bluegrass
[5]	Hairy wildrye

SITE CHARACTERISTICS

Moisture regime: subhygric
Nutrient regime: rich
Topographic position: level
Slope: level
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (26-39)(60-79)(16-25))
Humus form: moder, peaty mor
Surface texture: mesic, SiL, SiC, Si
Effective texture: humic, SiL, SiC, Si
Depth to Mottles/Gley: (0-25)
Drainage: imperfect, poor, mod. well, well
Parent material: F, FL, E
Soil subgroup:R.HG, O.R, GLCU.R, GL.R

RANGE PLANT COMMUNITY TYPES

F12 Sw-Aw/Scouring rush (n=1)
E12a Sw/Horsetail (n=4)
E12b Sw/Silverberry/Horsetail (n=1)

h3 horsetail shrubland (n=6)

CHARACTERISTIC SPECIES

Shrub

[40]	Willow
[1]	Red osier dogwood
[1]	Rose

Forb

[40]	Field horsetail
[1]	Sweet scented bedstraw
[1]	Tall lungwort
[1]	Dandelion

SITE CHARACTERISTICS

Moisture regime: hygric
Nutrient regime: rich
Topographic position: level
Slope: level
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (26-39)(60-79)(16-25))
Humus form: moder, peaty mor
Surface texture: mesic, SiL, SiC, Si
Effective texture: humic, SiL, SiC, Si
Depth to Mottles/Gley: (0-25)
Drainage: imperfect, poor, mod. well, well
Parent material: F, FL, E
Soil subgroup:R.HG, O.R, GLCU.R, GL.R

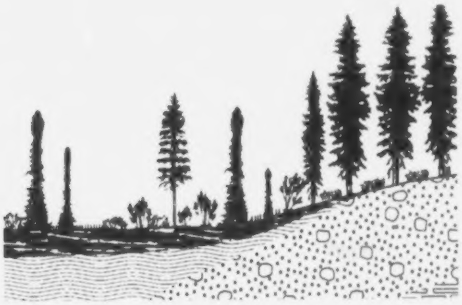
RANGE PLANT COMMUNITY TYPES

D7 Flat lv'd willow/Horsetail/Sedge (n=6)

ij fen (n=40)(taken from Ecosites of West-Central Alberta)

GENERAL DESCRIPTION

The rich and poor fen are combined in this ecosite. The fen ecosite is generally characterized by flowing oxygenated water and alkaline, nutrient-rich conditions. This ecosite occupies level, depressional and lower slope positions where impeded drainage or high water tables enhance the accumulation of organic matter consisting of sedges, golden moss, tufted moss, and brown moss. Black spruce, white spruce, and/or tamarack dominate the sparse canopy on the treed phase. Dwarf birch or willow form the canopy of the shrubby phase and sedges dominate the graminoid phase of this ecosite.



SUCCESSIONAL RELATIONSHIPS

Black spruce or white spruce are the edaphic climax trees on this ecosite. On calcareous materials black spruce may be replaced by white spruce as the climax tree species. Species composition and direction of succession changes with changing hydrologic regime. As with other wetlands, fens have slow successional rates so recovery from disturbance may also be slow.

INDICATOR SPECIES

Black spruce
tamarack
Willow
Labrador tea
Dwarf birch
Horsetail
Sedge
Golden moss
Brown moss
Tufted moss

subhydric/rich

SITE CHARACTERISTICS

Moisture regime: subhygric, hygric, subhydric,hydric
Nutrient regime: rich, very rich, medium
Topographic position: level, depression, toe
Slope: level, (0-1%)
Aspect: level, southerly, easterly

SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor, very poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

ECOSITE PHASES

ij treed fen (n=4)
ij shrubby fen (n=20)
ij graminoid fen (n=16)

ij1 treed fen (n=4)

CHARACTERISTIC SPECIES

Trees

[25]	Black spruce
[20]	White spruce
[5]	Larch

Shrub

[20]	Willow
[6]	Labrador tea
[2]	Dwarf birch

Forb

[1]	Field horsetail
[1]	Sweet scented bedstraw
[3]	Scouring rush
[1]	Dandelion

Grass

[20]	Sedge
[1]	Hairy wildrye
[7]	Wire rush

Moss

[10]	Golden moss

SITE CHARACTERISTICS

Moisture regime: subhygric, subhydric
Nutrient regime: rich, poor, medium
Topographic position: level, depression
Slope: level
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor, very poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

RANGE PLANT COMMUNITY TYPES

D12 Sb/Willow/Wire rush-Sedge/Moss (n=3)
E17 Sb-Lt/Labrador tea(n=1)

ij2 shrubby fen (n=20)

CHARACTERISTIC SPECIES

Trees

[2] Aspen

Shrub

[20] Willow
[4] Shrubby cinquefoil
[14] Dwarf birch

Forb

[2] Lindley's aster
[2] Strawberry
[1] Arrow leaved coltsfoot
[1] Fireweed

Grass

[22] Sedge
[2] Tufted hairgrass
[5] Wire rush
[2] Marsh reedgrass

Moss

[4] Golden moss

SITE CHARACTERISTICS

Moisture regime: subhygric, subhydric
Nutrient regime: very rich, rich medium
Topographic position: level, depression
Slope: level, (0-2%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor, very poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

RANGE PLANT COMMUNITY TYPES

D2a Drummond's willow (n=1)
D3a Bebb willow/Marsh reedgrass (n=1)
D8 Myrtle lv'd willow/Sedge (n=12)
D9 Basket willow/Sedge (n=3)
D9a Basket willow/Kentucky bluegrass (n=1)
D11 Sw/Willow/Water sedge/Golden moss (n=2)

ij3 graminoid fen (n=16)

CHARACTERISTIC SPECIES

Shrub

[1]	Willow

Forb

[5]	Purple avens
[3]	Smooth aster
[4]	Swamp horsetail
[1]	Fireweed

Grass

[43]	Sedge
[7]	Fowl bluegrass
[9]	Wire rush
[6]	Marsh reedgrass
[10]	Cattail
[2]	Great bulrush

SITE CHARACTERISTICS

Moisture regime: hygric, subhydric
Nutrient regime: very rich, rich
Topographic position: level, depression
Slope: level, (0-2%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

RANGE PLANT COMMUNITY TYPES

B12 Beaked-Water Sedge (n=8)
B12a Awned Sedge
B17 Creeping spike rush (n=1)
B18 Small fruited bulrush (n=1)
B19 Great bulrush (n=1)
B20 Cattail (n=2)

Results

The analysis of the 1292 plots distinguished 141 community types. These types were split into 9 categories:

A. Native grasslands (Banff and Jasper Mountain ecodistricts)	14 types
B. Native grasslands (Blairmore and Morley Foothills ecodistricts)	23 types
C. Disturbed grasslands (Blairmore and Morley Foothills ecodistricts)	15 types
D. Native shrublands	17 types
E. Conifer types	26 types
F. Mixedwood types	13 types
G. Deciduous types	16 types
H. Cutblocks	10 types
I. Cypress Hills	7 types

The dominant plant species, canopy cover, environmental conditions, forage production and carrying capacity are outlined for each community type.

Montane grassland ecology

The Montane subregion has highly variable ecological conditions. Much of the variation is the result of complex topography, while the small size of individual ecosystems results in a strong ecotonal effect from the surrounding environments (Strong 1992). Much of the grassland vegetation occurs on south and west facing slopes where seasonally low rainfall coupled with high evapotranspiration, dries the soil sufficiently to kill tree seedlings (Daubenmire 1978). Fire is also an important factor in determining the composition of grasslands because of the high flammability of the vegetation during the dry periods. A lack of fire and an increase in annual precipitation favours the growth of trees onto the more mesic sites.

The Whaleback ridge, Porcupine Hills and south into the Castle area are composed of a mixture of rough fescue grassland, aspen, Douglas fir and lodgepole pine. This area is characteristic of the Blairmore and Morley Foothills ecodistricts (Strong and Thompson 1995) an area of ridged and rolling hills, with moderate slopes (6-30%) and Black Chernozemic soils on submesic to mesic sites. In the Banff and Jasper river valleys and northern Montane areas (Grande Cache, Red Deer river valley) open Douglas fir, lodgepole pine and Fringed sage/Junegrass communities are common on steep south facing slopes, shallow rocky soils and coarse textured outwash (Strong 1992). These areas are typical of the Banff and Jasper Mountain ecodistricts. These ecodistricts have steep slopes (10-45%) and are dominated by Eutric Brunisolic soils, with submesic to xeric moisture regimes (Strong 1992).

The Cypress Hills ecodistrict is an unglaciated plateau ranging in elevation from about 1300 m in the east to1465 m at the highest point. Once considered boreal foothills, the area has been reclassified as montane given the bimodal summer precipitation peaks (June and September), the potential for freezing temperatures in all months and the combination of closed-canopied lodgepole pine forest with fescue grassland (Strong and Leggatt 1992). Soil parent materials are somewhat unique on the plateau where ancient tertiary gravels are exposed, or, may be capped by a variable veneer of loess; fine silty material deposited by wind from post glacial lake beds to the west of the plateau. Soils are mostly Black Chernozems where grassland vegetation has dominated. Thelma soils are loamy Orthic Black Chernozems associated with rough fescue communities on the top of the bench. Also associated with rough fescue cover, Delmas and Marmaduke soil series are gravel and shallow to gravel Orthic Dark Brown Chernozems found on the shoulder of the escarpment. Orthic Dark Grey Luvisols, like the soils series Reesor (loamy) have developed where lodgepole pine or aspen forest have prevailed (Greenlee 1981). The grassland community types of the Montane subregion are outlined in Table 2.

Banff and Jasper Mountain ecodistricts

The two dominant grassland communities in Banff and Jasper National Park include the Fringed sage/Junegrass and Northern wheatgrass-Sheep fescue community types. These communities are typical of steep, south and westerly facing slopes with xeric to subxeric moisture regimes. The soils are poorly developed and nutrient poor. Variants of these community types included the Pussy toes/Junegrass community, which is also found on shallow,

Table 2. Grassland community types of the Montane subregion.(*estimated production)

Community name	Community type	Productivity(kg/Ha)				Moisture	Drainage	Carrying capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
A.	**Banff and Jasper Mountain ecodistricts**							
A1.	Fringed sage/Junegrass	-	-	-	250-750*	Subxeric	Rapidly	4-18
A2.	Northern wheatgrass-Sheep fescue	-	-	-	400*	Subxeric	Rapidly	4.0
A3.	Small leaved everlasting/Junegrass	-	-	-	250*	Xeric	Rapidly	18.0
A4.	Juniper/Northern wheatgrass-Columbia needlegrass	-	-	-	250*	Xeric	Rapidly	18.0
A5.	Little clubmoss/Richardson needlegrass	-	-	-	385*	Subxeric	Rapidly	2.4
A6.	Kentucky bluegrass-Junegrass/Dandelion	-	-	-	1500*	Submesic	Well	0.6
A7.	Bearberry/Juniper	-	-	-	500*	Subxeric	Well	1.8
A8.	Rose-Snowberry	-	-	-	750*	Submesic	Well	3.0
A9.	Tufted hairgrass-Sedge	1208	98	0	1256	Subhygric	Mod. Well	1.1
A10.	Bog birch/Sedge-Rough fescue	592	198	12	802	Mesic	Well	1.7
A11.	Rough fescue-Fringed brome-Sedge	802	322	82	1207	Submesic	Well	1.1
A12.	Rough fescue-Sedge-Junegrass	584	228	69	881	Subxeric	Rapidly	1.5
A13.	Sedge-Junegrass	451	71	5	520	Submesic	Well	2.6
A14.	Creeping red fescue-Timothy	-	-	-	1500	Mesic	Well	0.9
B.	**Blairmore and Morley Foothills ecodistricts**							
B1.	Rough fescue-Idaho fescue-Parry oatgrass	1338	526	83	1912	Mesic	Well	0.5
B2.	Idaho fescue-Parry oatgrass-Rough fescue	951	353	55	1363	Mesic	Well	0.7
B3.	Bluebunch wheatgrass-Sedge	750	457	238	1456	Subxeric	Rapidly	2.0
B4.	Rough fescue-Sedge/Bearberry	798	499	617	1540	Subxeric	Rapidly	1.5
B5.	Big sagebrush/B.wheatgrass-Sedge	182	250	276	708	Subxeric	Rapidly	2.0
B6.	Saskatoon-Rose-Snowberry/Bearberry	232	570	240	1335	Subxeric	Rapidly	1.8
B6a.	Snowberry-Rose-Saskatoon	879	543	136	1303	Mesic	Well	1.8

Table 2. Grassland community types of the Montane subregion (continued).

Community name	Community type	Productivity(kg/Ha) Grass	Forb	Shrub	Total	Moisture	Drainage	Carrying capacity (ha/AUM)
B7.	Pinegrass-Hairy wildrye/Strawberry	1487	1003	0	2260	Mesic	Well	0.8
B8.	Douglas fir/Idaho fescue-Rough fescue	565	238	1592	2395	Submesic	Well	0.7
B9.	Douglas fir/Idaho fescue-Sandberg bluegrass	-	-	-	1750*	Submesic	Well	0.8
B10.	Aw/Strawberry/Rough fescue	1170	1206	0	2376	Hygric	Mod. Well	1.5
B11.	Thimbleberry	2190	25	186	2632	Subhygric	Mod. Well	2.5
B12.	Beaked -Water Sedge	2298	608	-	2906	Hydric	Imperfectly	0.4
B12a	Awned Sedge	2000	150	-	2150	Hydric	Imperfectly	0.4
B13.	Tufted hairgrass-Baltic rush	2238	239	170	2646	Hygric	Poorly	1.0
B13a	Baltic rush				1250*	Hygric	Poorly	0.8
B14.	Forb meadows	824	146	292	1262	Subhygric	Well	0.7
B15.	Rough fescue-Hairy wildrye	1996	645	96	2737	Mesic	Well	0.5
B16.	Big sagebrush-Buckthorn/K. bluegrass	268	745	141	1154	Mesic	Well	0.8
B17.	Creeping spike rush				1200*	Hygric	Poorly	0.8
B18	Small fruited bulrush				1500*	Hygric	Poorly	0.7
B19	Great bulrush				2200*	Hydric	Very poorly	0.5
B20	Cattail				2500*	Hydric	Very poorly	0.5
C.	**Blairmore and Morley Foothills ecodistricts (disturbed grasslands)**							
C1.	Idaho fescue-Parry oatgrass-Sedge	1347	456	9	1812	Mesic	Well	0.7
C1a.	Sedge-P.oatgrass-Idaho fescue				1000*	Submesic	Rapidly	1.0
C2.	Canada bluegrass-R. fescue-S.wheatgrass	1455	542	9	1637	Mesic	Well	0.5
C3.	Kentucky bluegrass-Rough fescue	1749	587	47	2365	Mesic	Well	0.5
C4.	Kentucky bluegrass-Timothy/Dandelion	1762	696	52	2510	Mesic	Well	0.5
C5.	Smooth brome-Kentucky bluegrass	1596	292	38	1925	Mesic	Well	0.5
C6.	Sedge/Little clubmoss-Moss phlox	460	355	67	881	Submesic	Rapidly	1.5
C6a.	Little clubmoss/Sedge				700*	Submesic	Well	1.8

Table 2. Grassland community types of the Montane subregion (continued).

Community name	Community type	Productivity(kg/Ha)				Moisture	Drainage	Carrying capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
C7.	Creeping red fescue/Dandelion-Clover	1833	601	0	2434	Mesic	Well	0.5
C8.	Northern wheatgrass-Kentucky bluegrass	1112	642	82	1836	Submesic	Well	3.0
C9.	Rough fescue-Kentucky bluegrass	1139	449	28	1611	Mesic	Well	0.5
C10.	Rough fescue-Sedge-Brome	2185	136	0	2321	Mesic	Well	0.5
C11.	Snowberry-Kentucky bluegrass	1184	0	2464	3648	Mesic	Well	1.1
C12.	Aw/Orchardgrass-Kentucky bluegrass	1000	300	400	1700	Mesic	Well	0.7
C13.	Sedge-Junegrass-B. wheatgrass				900*	Subxeric	Rapidly	2.5
I.	**Cypress Hills ecodistrict**							
I1.	Foothills rough fescue-Western porcupine grass	1361	62	-	1423	Submesic	Well	0.6
I2.	Shrubby cinquefoil/Foothills rough fescue-Intermediate oatgrass	1980	278	-	2258	Mesic	Well	0.4
I3.	Shrubby cinquefoil/Foothills rough fescue-Golden bean				1928*	Mesic	Well	0.5
I4.	Shrubby cinquefoil/Foothills rough fescue-Idaho fescue				1850*	Mesic	Well	0.5
I5.	Snowberry/Kentucky bluegrass-Timothy				1245*	Mesic	Well	0.7
I6.	Silverberry/Kentucky bluegrass				1250*	Mesic	Well	0.7

south facing slopes and the Juniper/Northern wheatgrass community which is typical of regosolic, eolian sand dunes of the Athabasca river valley near Jasper (Corns and Achuff 1982). A Little clubmoss/Richardson needlgrass community was also found on shallow south facing slopes in small isolated areas within the fir, white spruce, lodgepole pine and douglas fir forests.

A Kentucky bluegrass-Junegrass/Dandelion community type was described on lower to level slope positions with submesic to subxeric moisture regimes. The presence of a high cover of Junegrass indicates the close affinity this grassland has with the Fringed sage/Junegrass community type. The high cover of Kentucky bluegrass is indicative of heavy grazing influence on this community type.

There were two upland shrub communities found on steep south facing slopes (Bearberry/Juniper and Rose-Snowberry). These community types represented the transition from grassland to forest. The Bearberry/Juniper community type represents the transition from the grassland communities to the dry lodgepole pine, douglas fir and spruce forests. In contrast the Rose-Snowberry shrubland appears to represent the transition to moister deciduous and spruce forests.

The grasslands in the Ya Ha Tinda area of the Banff and Jasper ecodistricts are transitional between the grasslands described in Banff and Jasper National Parks and the grasslands in the Morley and Blairmore Foothills ecodistricts of southern Alberta. Rough fescue[1] is common in the Ya Ha Tinda which gives these grasslands some affinity to the rough fescue dominated grasslands in Southern Alberta. The predominance of junegrass and northern wheatgrass in the Ya Ha Tinda also gives these grasslands some affinity to the grasslands described near Banff and Jasper. The grasslands of the Ya Ha Tinda tend to be dry and well drained. They occur on south and west facing slopes and coarse textured fluvial areas. The dry slopes tend to have a predominance of rough fescue, sedge and junegrass. In contrast the level fluvial areas have a predominance of rough fescue and fringed brome. There are a number of community types in the Ya Ha Tinda that are transitional to the Upper Foothills and Subalpine subregions. These include the Tufted hairgrass-Sedge and Bog birch/Sedge-Rough fescue dominated community types.

Blairmore and Morley Foothills ecodistricts

The dominant grassland community types of these ecodistricts near the Porcupine hills and south into the Castle area are outlined in Figures 1 and 2. The Rough fescue-Idaho fescue-Parry oatgrass dominates mesic to submesic, lower slope positions and terraces with Black Chernozemic soils. Situated upslope from this plant community on slightly drier sites with poorer soils, Parry oatgrass and Idaho fescue replace rough fescue as the dominant grass to form the Idaho fescue-Parry oatgrass-Rough fescue community type. The Bluebunch wheatgrass-Sedge community is found on steep south-facing slopes with Regosolic and Brunisolic soils. Further upslope on dry sandstone outcrops and xeric hillcrests, limber pine dominated community types are very common. A Rough fescue-Sedge/Bearberry-dominated community type is found on hilltops throughout the area. This type tends to be drier than the lower slope dominated rough fescue community type, but it is moister and not as rapidly drained as the Bluebunch wheatgrass-Sedge and limber pine dominated community types. Douglas fir invasion is common on these hilltop community types, to form the Douglas fir/Idaho fescue-Rough fescue and Douglas fir/Idaho fescue-Sandberg bluegrass community types. At higher elevations the ecotone between forest and grassland is dominated by the Snowberry-Rose-Saskatoon/Bearberry community type on drier sites and by the Pinegrass-Hairy wildrye community on moister sites with northerly aspects.

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[1] Throughout the guide the rough fescue species listed for the Banff and Jasper ecodistricts is likely a mixture of foothills rough fescue (*Festuca campestris)* and northern rough fescue (*Festuca altaica*), whereas the rough fescue listed for the Blairmore and Morley Foothills ecodistricts is Foothills rough fescue only (*F. campestris*). The rough fescue listed in the Cypress Hills is a mixture of foothills rough fescue (*F. campestris*) and plains rough fescue (*F. hallii*) (Hill et al. 1995).

A Big sagebrush/Bluebunch wheatgrass-Sedge community type was described on a gravelly south facing slope south of Blairmore. This community type is rare in Alberta and appears to be an extension of the Palouse prairie from Eastern Washington (Moss 1947).

There are a number of community types that are characteristic of moist, poorly drained, nutrient rich sites. These include Thimbleberry brush, Sedge meadows, Tufted hairgrass-Baltic rush and Forb meadows. The Tufted hairgrass-Baltic rush community has plant species that are more characteristic of the Subalpine subregion (Willoughby 1999) and may represent the transition to the subalpine. Thompson and Hansen (2002) have described a number of graminoid wetland dominated communities. These types have been included in this guide. These types include Water, Beaked and Awned sedge, creeping spike rush, bulrush and cattail dominated meadows. These community types are not common in the higher elevations of the Montane and are generally found in the eastern part of the Montane and are transitional to the Foothills Fescue and Foothills Parkland subregions.

There are a number of different grassland community types that have been influenced by grazing pressure. Increased grazing pressure on a rough fescue dominated community type leads to a decline in rough fescue and an increase in Parry oatgrass and Idaho fescue to form the Idaho fescue-Parry oatgrass-Sedge community (Willoughby 1992). Continued heavy grazing pressure allows Kentucky or Canada bluegrass to establish to form the Kentucky bluegrass-Rough fescue or Canada bluegrass-Rough fescue community types. Continued heavy grazing pressure eventually leads to a decline in all native species and the site is dominated by Kentucky bluegrass and dandelion to form the Kentucky bluegrass\Dandelion community type. There are a number of community types that have been seeded to tame forage species through cultivation or reclamation. These include the Smooth brome-Kentucky bluegrass and Creeping red fescue/Dandelion-Clover community types.

On the drier slopes increased grazing pressure on the Idaho fescue-Parry oatgrass-Rough fescue and Bluebunch wheatgrass community types leads to an increase in low growing forbs and graminoids to form the Sedge/Little clubmoss-Moss phlox community type. On moister sites in these community types, grazing disturbance also leads to the formation of Parry oatgrass-Timothy and Northern wheatgrass-Kentucky bluegrass dominated community types.

Cypress Hills ecodistrict

Plant communities described in the Cypress Hills are associated with the nearly level plateau or the upper edges of the steep escarpment or rolling uplands. They include a mixture of rough fescue grassland and closed canopy aspen and lodgepole pine dominated forests. The Rough fescue (*Festuca campestris* Rydb.) related plant communities of the Cypress Hills Plateau are unique in the relatively high canopy of Shrubby Cinquefoil (compared to fescue communities described in southwestern Alberta and appears to be a function of the gravelly soil) and the abundance of Intermediate oat grass, a major subdominant grassland species (Moss 1955). On the steep, dry slopes Western Porcupine grass often replaces Intermediate oatgrass in these grassland communities. Idaho fescue also replaces Intermediate oatgrass on shallower soils with gentler slopes. An unresolved issue is the apparent expression of Rough fescue as the Foothills Rough fescue (*F. campestris* Rydb.) bunch grass type on the top of the plateau and the Plains Rough fescue (F. hallii Vassey) rhizomatous form on the adjoining slopes of the Cypress Hills.

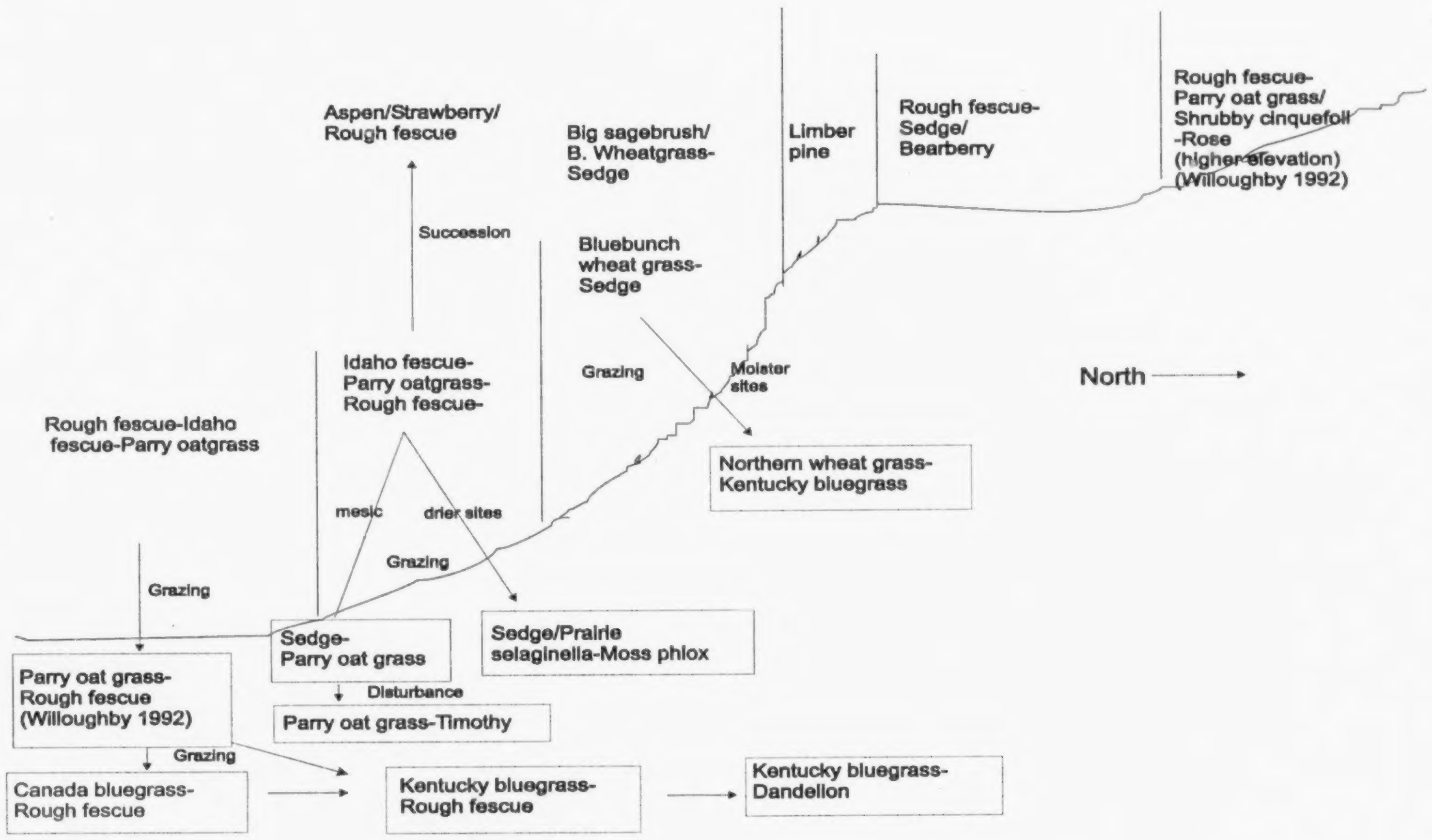
Aspen/Strawberry/
Rough fescue
Big sagebrush/
B. Wheatgrass-
Sedge
Limber
pine
Rough fescue-
Sedge/
Bearberry
Rough fescue-
Parry oat grass/
Shrubby cinquefoil
-Rose
(higher elevation)
(Willoughby 1992)
Succession
Bluebunch
wheat grass-
Sedge
Idaho fescue-
Parry oatgrass-
Rough fescue-
Grazing
Moister
sites
North
Rough fescue-Idaho
fescue-Parry oatgrass
Northern wheat grass-
Kentucky bluegrass
mesic
drier sites
Grazing
Grazing
Sedge-
Parry oat grass
Sedge/Prairie
selaginella-Moss phlox
Parry oat grass-
Rough fescue
(Willoughby 1992)
Disturbance
Parry oat grass-Timothy
Grazing
Canada bluegrass-
Rough fescue
Kentucky bluegrass-
Rough fescue
Kentucky bluegrass-
Dandelion

Figure 3. Ecology of grassland communities in the Foothills ecodistricts of the Montane subregion

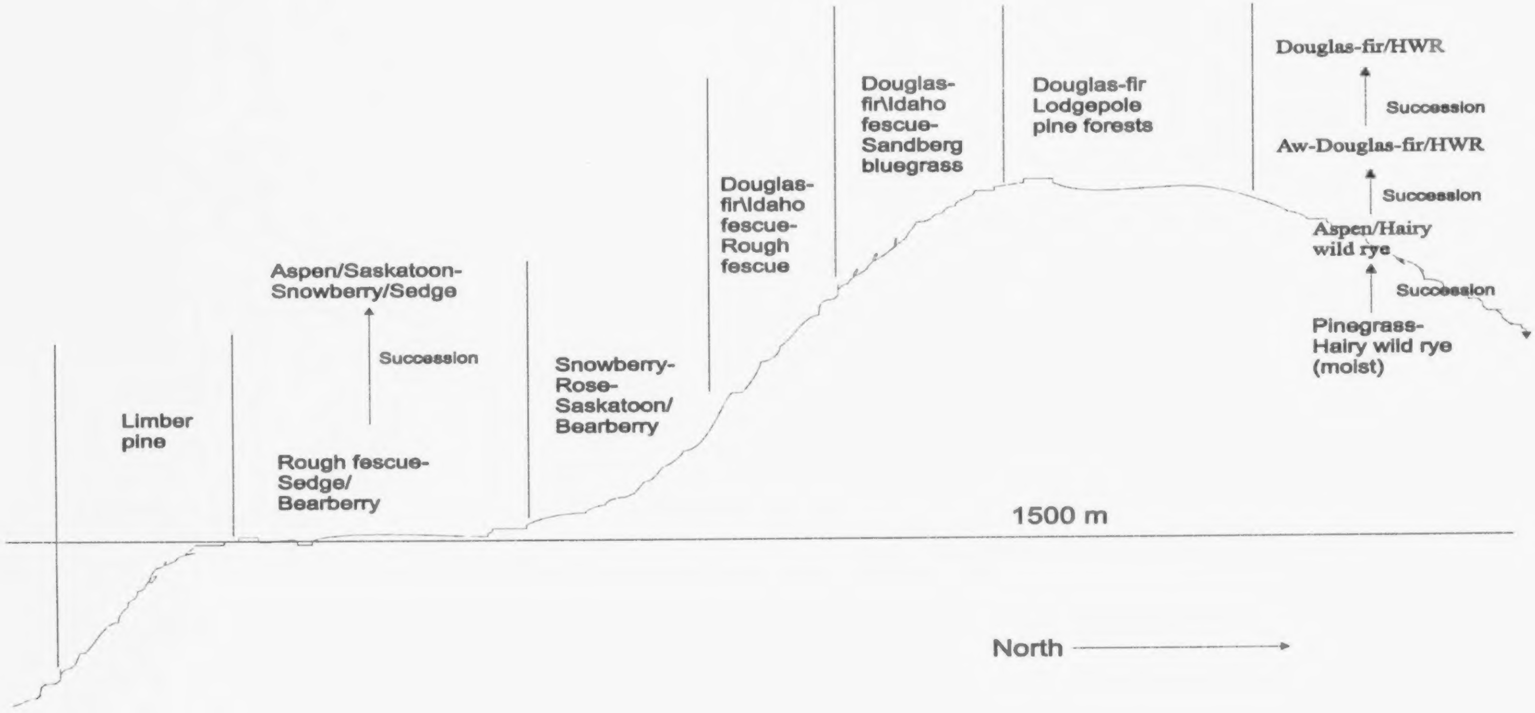
Limber pine
Aspen/Saskatoon-Snowberry/Sedge
Succession
Rough fescue-Sedge/Bearberry
Snowberry-Rose-Saskatoon/Bearberry
Douglas-fir\Idaho fescue-Rough fescue
Douglas-fir\Idaho fescue-Sandberg bluegrass
Douglas-fir Lodgepole pine forests
Douglas-fir/HWR
Succession
Aw-Douglas-fir/HWR
Succession
Aspen/Hairy wild rye
Succession
Pinegrass-Hairy wild rye (moist)
1500 m
North

Figure 4. Ecological sequence of the Grassland-Forest transition communities in the Montane subregion.

Native grassland key

1. Grasslands found in Banff, Jasper, Ya Ha Tinda or Cypress Hills..2
Grasslands found in the Porcupine Hills, Castle, Gap or Whaleback.....**Blairmore and Morley Foothills ecodistricts**
2. Grasslands found in Banff, Jasper or Ya Ha Tinda.................................**Banff and Jasper Mountain ecodistricts**
Grasslands found in the Cypress Hills..**Cypress Hills ecodistrict**

Blairmore and Morley Foothills ecodistricts

1. Grassland shows signs of extensive grazing pressure, such as a reduction in tall forbs, and an increase in invader species such as Kentucky bluegrass, dandelion, Timothy, Creeping red fescue, and Smooth brome, Orchardgrass.Disturbed grasslands

Native grasslands, recovering grasslands, or invaded exclosure sites dominated by Rough fescue, Parry oatgrass, Idaho fescue, and Bluebunch wheatgrass, and invaded by Kentucky bluegrass or Mountain brome(also includes grasslands being encroached by trees Fd, Aw).. 2

2. Grassland forest transition. Aw, Fd, Pinegrass, Snowberry, Saskatoon, and Rose present in the canopy................ 3

South facing slopes or hilltops dominated by, Rough fescue, Parry oatgrass, Bluebunch wheatgrass, Big sagebrush or , depressional or seepage areas dominated by Thimbleberry, sedges, bulrushes or cattails. Site may or may not contain tame species such as Kentucky bluegrass and Mountain brome.. 7

3. Douglas fir is present.. 4

Aw, Pinegrass, snowberry, Saskatoon, Rose or Bearberry dominant.. 5

4. Idaho fescue and Rough fescue are dominant and the community is a transition between fescue grassland and Douglas fir dominated forest..**Fd/Idaho fescue-Rough fescue** b8

Idaho fescue and Sandberg bluegrass are dominant. Site is also a transition to Douglas fir forest, but is much drier than the above as is indicated by the presence of Sandberg bluegrass, Little club moss and Fringed sage..................... ....
....**Fd/Idaho-fescue-Sandberg bluegrass** b9

5. Moist mesic sites(pinegrass dominated or aspen invaded grasslands).. 6

Dry or seepage sites containing bearberry snowberry-Saskatoon, and rough fescue. A transition site between Rough fescue dominated grasslands and Douglas fir and Lodgepole pine dominated forests.. 5a

5a. Dry upper slope positions dominated by Saskatoon and Bearberry........... **Saskatoon-Rose-Snowberry/Bearberry** b6

Moist seepage areas dominated by Snowberry and Rose.............**Snowberry-Rose-Saskatoon** b6a

6. Sites dominated by Pinegrass and Hairy wildrye. Area receives some seepage throughout the growing season and has a high forb cover. High moisture of the site allows for production of over 2000kg/ha..**Pinegrass-Hairy wildrye/Strawberry** b7

Sites dominated by Rough fescue and Strawberry, and is a transition from a Rough fescue dominated grassland to an Aspen dominated forest. Aspen trees have moved onto a fescue grassland and the understory is moving towards a Strawberry/Slender wheatgrass, and this community type is part of the transition..**Aw/Strawberry/Rough fescue** b10

7. Moist sites dominated by Thimbleberry, sedges, bulrushes, Cattails Lindley's aster and Wild bergamont, Tufted hairgrass, or Big sagebrush-Buckthorn..
8

Lower slopes with deep soils, and moist conditions, or Hilltops and steep south facing slopes, Bluebunch wheatgrass, Big sagebrush, Rough fescue, and Sedge dominant.. 12

8. Sites are nutrient rich seepage areas dominated by Thimbleberry..**Thimbleberry** b11

Sites dominated by sedges, bulrushes, cattails, Lindley's aster and Wild bergamont, Tufted hairgrass, or Big sagebrush-Buckthorn..9

9. Sites are commonly wet, experience periodic flooding, and dominated by sedges, bulrushes, rushes or cattails........**9a**

Sites dominated by Lindley's aster and Wild bergamont, Tufted hairgrass, or Big sagebrush-Buckthorn................ **10**

9a Wet sites dominated by sedges..**9b**

Wet sites dominated by bulrushes, rushes or cattails..**9c**

9b Sites dominated by water or beaked sedge.. **Beaked-Water sedge b12**

Sites dominated by awned sedge.. **Awned sedge b12a**

9c Site dominated by bulrush or rush species..**9d**

Site dominated by cattails or creeping spike rush..**9f**

9d Grazed site dominated by baltic rush.. **Baltic rush b13a**

Ungrazed site dominated by bulrushes..**9e**

9e Site dominated by small fruited bulrush.. **Small fruited bulrush b18**

Very wet site dominated by great bulrush.. **Great bulrush b19**

9f Very wet sites dominated by cattails.. **Cattails b20**

Boggy sites dominated by creeping spike rush.. **Creeping spike rush b17**

10. Sites is a small isolated forest opening dominated by forbs specifically Lindley's aster and Wild bergamont. Sites tend to be moist and well drained and probably receive some nutrient seepage at some point in the year...............**Forb meadows** b14

Sites dominated by Tufted hairgrass, or Big sagebrush-Buckthorn.. **11**

11. Sites dominated by Tufted hairgrass, and are located on moist meadows at higher elevations and slightly drier than the Sedge meadows community type..**Tufted hairgrass-Baltic rush** b13

Sites dominated by Big sagebrush-Buckthorn. Sites dominated by Buckthorn will be moist areas of meadows with fine textured soils. Big sagebrush dominated sites will found on drier creek beds with gravely soils....................................
....**Big Sagebrush-Buckthorn/Kentucky bluegrass** b16

12. Lower slope sites with deep soils. Rough fescue, Parry's oatgrass, or Idaho fescue Hairy wildrye dominant........... **13**

Hilltops and steep south facing slopes. Bluebunch wheatgrass, Big sagebrush, Rough fescue and sedge dominant.. **18**

13. Mesic lower slope and level areas, Rough fescue dominant.. **14**

Upper slopes, Parry oatgrass, Idaho fescue dominant.. **17**

14. Site is predominantly native species very little tame species... **15**

Site shows signs of extensive grazing pressure, particularly the reduction in tall forbs and the invasion of tame grass species such as Kentucky bluegrass and timothy... **16**

15. Site is the modal grassland community type on Black Chernozemic soils in the foothills of southern Alberta. On rocky and gravelly slopes Rough fescue is replaced by Parry's oatgrass and Idaho fescue...
....**Rough fescue-Idaho fescue-Parry oatgrass** b1

Site represents the transition between the lower Montane subregion and the higher Subalpine region (hairy wildrye co-dominant)..**Rough fescue-Hairy wildrye** b15

16. Site is found in lower slope positions that have been moderately grazed. Mountain brome has invaded................
....**Rough fescue-Sedge-Mountain brome** c10

Site has been heavily grazed to the point that Kentucky bluegrass has invaded, and is now recovering or is an ungrazed exclosure that has been invaded by Kentucky bluegras..**Rough fescue-Kentucky bluegrass** c9

17. Site occupies lower slope positions and represents a Rough fescue-Idaho fescue-Parry oatgrass community type that has been moderately or heavily grazed for a number of seasons...................................**Idaho fescue-Parry oatgrass-Sedge** c1

Site is up slope and is drier than the Rough fescue-Parry oatgrass-Idaho fescue community type and is dominated by Parry oatgrass, Idaho fescue or Sedge... 17a

17a Lightly grazed site dominate by Idaho fescue-Parry oatgrass and rough fescue..**I.fescue-P.oatgrass-R.fescue** b2

Moderately grazed site dominated by Sedge.................................**Sedge-Idaho fescue-Parry oatgrass** c1a

18. Site is located on hilltops, and has shallow poorly developed soils. This community is drier than Rough fescue communities in lower slope positions, and wetter than the Bluebunch wheatgrass community found on southerly slopes. Rough fescue, sedge, and Bearberry are dominant..**Rough fescue-Sedge/Bearberry** b4

Site is located on a south facing slope.. **19**

19. Site is dominated by Big sagebrush, and located on gravelly south facing slopes..
....**Big sagebrush/Bluebunch wheatgrass** b5

Site is dominated by Bluebunch wheatgrass and sedge, or site is moderately grazed and dominated by Sedge, Moss phlox and Little club moss.. **20**

20. Bluebunch wheatgrass is dominant. Site is found on well drained south facing slopes
....**Bluebunch wheatgrass-Sedge** b3

Moderately to heavily grazed gravelly site within the Parry oatgrass-Rough fescue and Bluebunch wheatgrass dominated community types. Sedge, Moss phlox, Little club moss or fringed sage are dominant... 21

21 Moderately grazed site dominated by sedge.............**Sedge/Little clubmoss-Moss phlox** c6

Heavily grazed site dominated by Little clubmoss, Moss phlox or fringed sage ....**Little clubmoss/Sedge** c6a

Disturbed grassland key

1. Community results from grazing pressure... **3**

Community results from seeding an area with tame grasses.. **2**

2. Site is a natural gas pipeline or power transmission line that has been seeded to Creeping red fescue. Originally the site was a rough fescue grassland...**Creeping red fescue/Dandelion-Clover** c7

Site was once a Rough fescue dominated community, but it has been cultivated and seeded to Smooth brome or orchardgrass..2a

2a Smooth brome dominated community.. **Smooth brome-Kentucky bluegrass c5**

Orchardgrass present, Aspen maybe invading...**Aw/Orchardgrass-K. bluegrass** c12

3. Dry sites.. **4**

Mesic and moist sites... **7**

4 Site is a dry site found at lower slope positions dominated by Idaho fescue and Parry oatgrass. Grazing caused a decrease in Rough fescue and an increase in Idaho fescue, Parry oatgrass and sedge. 4a

Site dominated by Northern wheatgrass, Sedge and Little club moss, or Canada bluegrass.......................... **5**

4a. Moist site lower slope position, dominated by Idaho fescue, Parry oatgrass with some Rough fescue......................
....**Idaho fescue-Parry oatgrass-Sedge** c1

Dry upper slope positions dominated by sedge... 4b

4b. Moister sites which represent the grazed Parry oatgrass ecological site........**Sedge-Parry oatgrass-Idaho fescue** c1a

Dry sites which represent the grazed Bluebunch wheatgrass ecological site..**Sedge-Junegrass-B. wheatgrass** c13

5. Site found on dry moderately to heavily grazed south facing slopes with shallow soils above the Oldman river. Community is dominated by Northern wheatgrass..**Northern wheatgrass-Kentucky bluegrass** c8

Sites dominated by Sedge and Little clubmoss, or Canada bluegrass.. **6**

6. Site is dry and gravelly in a Parry oatgrass-Rough fescue and Bluebunch wheatgrass dominated community type. Site is dominated by Sedge and Little clubmoss.. 6a

Site is on shallow nutrient poor soils on lower slope positions, indicative of communities containing Canada bluegrass, blunt sedge, Junegrass, and Plains reedgrass.............................**Canada bluegrass-Rough fescue-Slender wheatgrass** c2

6a. Moderately grazed site dominated by sedge..............**Sedge/Little clubmoss-Moss phlox** c6

Heavily grazed site dominated by Little clubmoss, Moss phlox or fringed sage ....**Little clubmoss/Sedge** c6a

7. Site is found on lower slope positions along the valley bottoms of the Porcupine Hills. Sites contain sufficient moisture to support the growth of Snowberry and Kentucky bluegrass..**Snowberry/Kentucky bluegrass** c11

Sites found on the lower sections of south facing slopes with mesic to subhygric moisture regimes and no Snowberry **8**

8. Site contains Mountain brome..**Rough fescue-Sedge-Mountain brome** c10

Sites where Kentucky bluegrass is a dominant component.. **9**

9. Timothy is a major grass in the community..**Kentucky bluegrass-Timothy/Dandelion** c4

No or little Timothy in the community.. **10**

10. Heavily grazed grassland which is recovering, Rough fescue is more prevalent than Kentucky bluegrass........... ....**Rough fescue-Kentucky bluegrass** c9

Heavily grazed grassland, Kentucky bluegrass is more prevalent than the native species in community.............. ....**Kentucky bluegrass-Rough fescue** c3

Banff and Jasper Mountain ecodistricts

1. Ya Ha Tinda area.. **2**

Forest transition and south facing slopes, level areas, or sand dunes associated with White spruce forests in Banff and Jasper National Parks... **7**

2. Moist sites dominated by Tufted hairgrass and Bog birch.. **3**

Mesic sites dominated by Rough fescue, Sedge, and Junegrass... **4**

3. Site is moist and better drained than pure sedge meadows. Tufted hairgrass dominates the vegetation...**Tufted hairgrass-Sedge** a9

Site is a fescue grassland invaded with Bog birch. Bog birch, Rough fescue, Sedge are dominate...................... ....**Bog birch/Sedge-Rough fescue** a10

4. Rough fescue dominated.. **5**

Grazing modified or cultivated.. **6**

5. Site occurs on steeper, morainal and colluvial slopes. There is little Fringed brome on the site because of the dry site conditions, Junegrass is predominant...**Rough fescue-Sedge-Junegrass** a12

Site is located on coarse textured fluvial areas and moister south and west facing slopes. Rough fescue, Sedge, and Fringed brome are dominant...**Rough fescue-Fringed brome-Sedge** a11

6. Site has coarse textured fluvial soils and has been modified by grazing. Sedge and Junegrass dominate the site..**Sedge-Junegrass** a13

Site is a spruce cutblock that was seeded to Creeping red fescue and Timothy.....**Creeping red fescue-Timothy** a14

7. Forest transition. Little clubmoss, Richardson needlegrass, Bearberry, Juniper, Rose, Snowberry dominant........ **8**

South facing slopes and level areas. Ungrazed sites dominated by Fringed sage, Northern wheatgrass, Junegrass, and Small leaved everlasting or sand dunes associated with White spruce forests. Grazed sites dominated by Kentucky bluegrass, Dandelion, and Junegrass.. **10**

8. Juniper, Rose, Snowberry, Bearberry are dominant.. **9**

Site is located on an isolated south facing slope within the Pine-Spruce-Fir forests at higher elevations. Richardson needlegrass present.. **Little clubmoss/Richarson needlegrass** a5

9. Site is a forest-grassland ecotone on dry, rocky south facing slope in the Banff and Jasper river valleys. Bearberry and Juniper are dominant...**Bearberry/Juniper** a7

Site is a forest grassland ecotone on south facing slopes both in the Mountain and foothills ecodistricts. Area is moister with better developed soils than the Bearberry/Juniper community type. Moving towards a deciduous dominated forest. Rose and Snowberry dominant in the understory...**Rose/Snowberry** a8

10. Level areas... **11**

Lower elevations, sand dunes, or higher elevations... **12**

11. Gravelly soils found in the level areas in the Athabasca and North Saskatchewan river valleys near Jasper and Saskatchewan crossing. Small-leaved everlasting dominant ....**Small-leaved everlasting/Junegrass** a3

Grazed fescue grassland sites on lower and level slope positions with submesic to mesic moisture regimes. Kentucky bluegrass and dandelion dominant..**Kentucky bluegrass-Junegrass/Dandelion** a6

12. Site is found on the dry south facing lower slopes in the river valleys near Banff and Jasper. South facing slopes and the dessicating winds contribute to a climate similar to the Mixed Prairie subregion. Fringed sage and Junegrass dominant.. ....**Fringed sage/Junegrass** a1

Sand dunes and higher elevations than above community.. **13**

13. Area is sand dunes with white spruce stands growing in the mesic depressions between the sand dunes. This community type occupies lower elevation, dry, steep slopes, and is dominated by Juniper.................. ....**Juniper/Northern wheatgrass-Columbia needlegrass** a4

Site occupies the dry steep south facing slopes slightly higher elevations than Fringed sage/Junegrass. Northern wheatgrass and sheep fescue are dominant...**Northern wheatgrass-Sheep fescue** a2

Cypress Hills ecodistrict

1. Shrubby cinquefoil or rough fescue dominated sites.. **2**
   Moister sites dominated by snowberry or silverberry.. **5**
2. Shrubby cinquefoil dominated communities.. **3**
   Shrubby cinquefoil greatly reduced, site is found on slopes and dominated by Foothills rough fescue and Western porcupine grass.. **Foothills rough fescue-Western porcupine grass** **11**
3. Ungrazed communities dominated by rough fescue and codominated by Intermediate oatgrass or Idaho fescue. **4**
   Patched grazed community dominated by rough fescue and golden bean .. **Shrubby cinquefoil/Foothills rough fescue-Golden bean** **13**
4. Modal grassland community codominated by Intermediate oatgrass.. **Shrubby cinquefoil/Foothills rough fescue-Intermediate oatgrass** **12**
   Site with shallower soils codominated by Idaho fescue....**Shrubby cinquefoil/Foothills rough fescue-Idaho fescue** **14**
5. Seepage area dominated by silverberry... **Silverberry/Kentucky bluegrass** **16**
   Seepage area dominated by snowberry.. **Snowberry/Kentucky bluegrass** **15**

MONTANE SUBREGION

BANFF AND JASPER MOUNTAIN ECODISTRICTS

GRASSLAND COMMUNITY TYPES

Photo 2: Banff and Jasper Mountain ecodistricts. This is a typical grassland of south-facing slopes in Jasper National Park. The high population of wild ungulates in the National Parks has resulted in heavy use on many of these grassland communities.

A1. Fringed sage/Junegrass

(Artemisia frigida/Koelera macrantha)

n=11 This community type is typical of steep south facing slopes, at lower elevations in the river valleys near Banff and Jasper. It is similar to the Junegrass-Plains reedgrass community described by Stringer (1973) near Banff and Jasper, the Purple reedgrass/Fringed sage community described by Bailey et al. (1992) in the Yukon and the Fringed sage/Slender wheatgrass community described by Pojar (1982) in Northern British Columbia. The prominent species of these grasslands (junegrass, northern wheatgrass, fringed sage, pussy toes and bearberry) are typical of xerophytic and Mixed Prairie type grasslands throughout Western Canada. The dessicating winds of the area and steep south- facing slopes would contribute to a climate that is similar to the Mixed Prairie subregion (Strong 1992). Grazing has also seemed to have had an influence on this community type. Stringer (1973) felt that with protection from heavy wildlife grazing Plains reedgrass and northern wheatgrass would increase and fringed sage and junegrass would decrease. Bailey et al. (1992), found that fringed sage, pussy toes, bearberry and low growing sedges increased and purple reedgrass declined with increased grazing pressure on the Purple reedgrass/Fringed sage community type. It would appear the dry climate, and heavy grazing pressure by wild ungulates have contributed to the development of this grassland community.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-10	36
GROUND JUNIPER *(Juniperus communis)*	2	0-10	36
FORBS			
FRINGED SAGE *(Artemisia frigida)*	11	0-40	91
BEARBERRY *(Arctostaphylos uva-ursi)*	2	0-10	27
WILD BLUE FLAX *(Linum lewisii)*	3	0-20	64
SMALL LEAVED EVERYLASTING *(Antennaria parviflora)*	4	0-30	27
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	1	0-5	36
JUNEGRASS *(Koelera macrantha)*	16	0-40	100
PURPLE REEDGRASS *(Calamagrostis purpurascens)*	4	0-15	55
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	4	0-25	46

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC-XERIC
NUTRIENT REGIME:
SUBMESOTROPHIC
ELEVATION:
1244(990-1720) M
SOIL DRAINAGE:
WELL TO RAPIDLY
SLOPE:
29(2-65)%
ASPECT:
SOUTHERLY
ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION KG/HA

TOTAL 250-750 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4-18 HA/AUM
(0.04-0.1 AUMS/AC)

A2. Northern wheatgrass-Sheep fescue

(Agropyron dasystachyum-Festuca saximontana)

n=5 This community type is similar to the Fringed sage/Junegrass community type. It occupies dry, steep, south facing slopes at slightly higher elevations than the Fringed sage/Junegrass community in the river valleys near Banff and Jasper. This community type appears to be in better range condition than the Fringed sage/Junegrass community type. As Stringer (1973) found, when the Fringed sage/Junegrass type was protected from grazing northern wheatgrass increased in cover. The higher elevation of these sites may restrict access to wild ungulate grazing. Consequently, it would appear this community type is not grazed as heavily as the Fringed sage/Junegrass community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	4	0-18	20
FORBS			
COMMON FIREWEED *(Epilobium angustifolium)*	1	0-2	60
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	0-3	40
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	2	0-10	20
YELLOW BEARDS TONGUE *(Penstemon confertus)*	1	0-5	60
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	5	0-25	40
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	34	10-60	100
SHEEP FESCUE *(Festuca sacimontana)*	2	0-1	40
JUNEGRASS *(Koeleria macrantha)*	1	0-2	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1561(1220-1859) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
34(5-65)%

ASPECT:
SOUTHERLY

ECOLOGICAL STATUS SCORE: 16 OR 24

FORAGE PRODUCTION KG/HA

TOTAL 400 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM
(0.1 AUM/AC)

A3. Small-leaved everlasting/Junegrass

(Antennaria parviflora/Koeleria macrantha)

n=2 The two stands described in this community type are from dry, level areas in the Athabasca and North Saskatchewan river valleys near Jasper and Saskatchewan crossing. They are similar to the Fringed sage/Junegrass community type, but lack cover of fringed sage. Small leaved everlasting is known to be well adapted to xeric moisture conditions (Moss 1992) and is known to increase with increased grazing pressure (Stringer 1973, Bailey et al. 1992). Presently, it is not clear why fringed sage is absent from these sites.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL. *(Potentilla fruticosa)*	1	0-1	50
FORBS			
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	18	5-30	100
ALPINE MILK VETCH *(Astragalus alpinus)*	8	0-15	50
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1	0-2	50
FRINGED SAGE *(Artemisia frigida)*	1	0-1	50
GRASSES			
JUNEGRASS *(Koeleria macrantha)*	3	1-5	100
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	1	0-1	50
UPLAND SEDGE *(Carex spp.)*	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1160(1000-1380) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
1(0-2)%

ASPECT:
SOUTH TO WESTERLY

ECOLOGICAL STATUS SCORE: 16 OR 8

FORAGE PRODUCTION KG/HA

TOTAL 250 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
18 HA/AUM
(<0.04 AUM/AC)

A4. Juniper/Northern wheatgrass-Columbia needlegrass

(Juniperus horizontalis/Agropyron trachycaulum-Stipa columbiana)

n=2 This community type is distinguished from the other grassland community types in the Banff and Jasper river valleys by the presence of a high juniper cover. It occupies lower elevation, steep, xeric slopes with Regosolic and eolian soils. This community type often occurs in association with dense white spruce thickets which occur in mesic depressions between the sand dunes (Corns and Achuff 1982).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	1	1-1	100
CREEPING JUNIPER *(Juniperus horizontalis)*	16	2-30	100
GROUND JUNIPER *(Juniperus communis)*	4	0-8	50
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	3	0-5	50
ROSY EVERLASTING *(Antennaria rosa)*	8	0-15	50
ASCENDING PURPLE MILK VETCH *(Astragalus striatus)*	5	0-10	50
PRAIRIE GROUNDSEL *(Senecio canus)*	5	0-10	50
GAILLARDIA (BROWN-EYED SUSAN) *(Gaillardia aristata)*	3	0-6	50
GRASSES			
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	3	0-5	50
COLUMBIA NEEDLEGRASS *(Stipa columbiana)*	8	0-15	50
SHEEP FESCUE *(Festuca saximontana)*	4	0-8	50
RUSH LIKE SEDGE *(Carex scirpoides)*	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1285(1050-1410) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
39(30-48)%

ASPECT:
SOUTH TO WEST

PARENT MATERIAL:
AEOLIAN

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION KG/HA

TOTAL 250 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
18 HA/AUM
(<0.04 AUM/AC)

A5. Little clubmoss/Richardson needlegrass

(Selaginella densa/Stipa richardsonii)

n=1 This community type is representative of small isolated, south facing slopes within the pine-spruce-fir forests. Stringer (1973), described a similar community at higher elevations near Banff and Jasper. Stringer felt this grassland was unrelated to any grasslands in Western North America and thus seemed to be a distinct grassland type characteristic of the moister sites in the Fescue prairies-coniferous forest ecotone of Banff and Jasper.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
LITTLE CLUBMOSS *(Selaginella densa)*	15	-	100
SMALL- LEAVED EVERLASTING *(Antennaria parviflora)*	8	-	100
CUT LEAVED ANEMONE *(Anemone multifida)*	5	-	100
TUFTED FLEABANE *(Erigeron caespitosus)*	5	-	100
NODDING ONION *(Allium cernuum)*	2	-	100
SMALL FLOWERED BEARDTONGUE *(Penstemon procerus)*	2	-	100
GRASSES			
RICHARDSON NEEDLEGRASS *(Stipa richardsonii)*	8	-	100
PURPLE REEDGRASS *(Calamagrostis purpurascens)*	2	-	100
JUNEGRASS *(Koeleria macrantha)*	2	-	100
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	1	-	100
LICHEN	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1330 M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
15%

ASPECT:
SOUTHWEST

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION KG/HA

TOTAL 385 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.4 HA/AUM
(0.17 AUM/AC)

A6. Kentucky bluegrass-Junegrass/Dandelion

(Poa pratensis-Koeleria macrantha/Taraxacum offincinle)

n=3 This community type was described on lower to level slope positions, with submesic to mesic moisture regimes. The presence of a high cover of Kentucky bluegrass is indicative of the heavy grazing influence on this community type. On mesic to subhygric sites in the fescue grasslands heavy grazing pressure is known to cause a decline in native grass species allowing Kentucky bluegrass to increase (Willoughby 1992). The presence of junegrass indicates that this community has some affinity with the Fringed sage/Junegrass community found in the same area. In the absence of grazing this community type may resemble a Rough fescue/Upland sedge community described on hill crests in the Porcupine hills (Willoughby 1992).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-3	67
CREEPING JUNIPER *(Juniperus horizontalis)*	2	0-7	33
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	3	0-10	33
DANDELION *(Taraxacum offincinale)*	2	1-5	100
CUT LEAVED ANEMONE *(Anemone multifida)*	1	0-2	67
ASCENDING PURPLE MILK VETCH *(Astragalus striatus)*	5	0-15	33
LATE YELLOW LOCOWEED *(Oxytropis monticola)*	3	0-10	33
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	33	20-40	100
JUNEGRASS *(Koeleria macrantha)*	14	0-30	67
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	2	0-5	67
PARRY OATGRASS *(Danthonia parryii)*	2	0-5	67
COLUMBIA NEEDLEGRASS *(Stipa columbiana)*	5	0-15	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1328 (1110 - 1495) M

SOIL DRAINAGE:
WELL

SLOPE:
7(0-21)

ASPECT:
SOUTH

ECOLOGICAL STATUS SCORE: 8 OR 0

FORAGE PRODUCTION KG/HA

TOTAL 1500 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.6 HA/AUM
(0.68 AUM/AC)

A7. Bearberry/Juniper

(Arctostaphylos uva-ursi/Juniperus spp.)

n=25 This community type represents the forest-grassland ecotone on dry, rocky, windswept, south facing slopes throughout the Banff and Jasper river valleys and higher elevation sites in the Blairmore and Morley Foothills of the Montane. Indeed many of the stands described in this community type were placed into douglas fir and spruce forest types described by Corns and Achuff (1982). Lane et al. (2000), described a similar community type Low northern sedge/Bearberry on rocky hilltops in the Lower Foothills subregion near Hinton.

Plant Composition Canopy Cover(%)

	Mean	Range	Const.
Trees			
White spruce *(Picea glauca)*	4	0-25	50
Lodgepole pine *(Pinus contorta)*	2	0-11	44
Shrubs			
Juniper *(Juniperus communis, J. horizontalis)*	9	3-35	100
Buffaloberry *(Shepherdia canadensis)*	4	0-40	52
Shrubby cinquefoil *(Potentilla fruticosa)*	5	0-35	88
Forbs			
Bearberry *(Arctostaphylos uva-ursi)*	25	4-60	100
White camas *(Zigadenus elegans)*	2	0-20	28
Small leaved everlasting *(Antennaria parviflora)*	1	0-10	12
Grasses			
Rush like sedge *(Carex scirpoidea)*	2	0-20	16
Hairy Wild Rye *(Elymus innovatus)*	3	0-15	76
Junegrass *(Koeleria macrantha)*	2	0-3	44

Environmental Variables

Moisture Regime:
Xeric to subxeric

Nutrient Regime:
submesotrophic

Elevation:
1330(1000-1660) m

Soil Drainage:
well to rapidly

Slope:
28(0-68)%

Aspect:
Southerly-Westerly

Ecological Status score: 24

Forage Production Kg/ha

Total 500* *estimate

Ecologically Sustainable Stocking Rate
1.8 ha/AUM (0.2 AUM/ac)

A8. Rose-Snowberry

(Rosa acicularis-Symphoricarpos occidentalis)

n=6 This community type represents the forest-grassland ecotone on south facing slopes in both the Mountain and Foothills ecodistricts. This community type is moister and has better developed soils than the Bearberry/Juniper community type. This community type appears to be undergoing transition to a deciduous dominated forest. Many of the dominant understory species (rose, strawberry, northern bedstraw, tall lungwort and hairy wildrye) are all characteristic of deciduous stands (Willoughby and Downing 1995).

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	1	0-2	33
BALSAM POPLAR *(Populus balsamifera)*	1	0-6	17
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	23	0-60	67
SNOWBERRY *(Symphoricarpos albus)*	22	10-87	100
BUFFALOBERRY *(Shepherdia canadensis)*	1	0-4	67
SASKATOON *(Amelanchier alnifolia)*	3	0-12	50
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	1	0-8	17
NORTHERN BEDSTRAW *(Galium boreale)*	2	1-4	100
WILD STRAWBERRY *(Fragaria virginiana)*	12	1-52	100
TALL LUNGWORT *(Mertensia paniculata)*	1	0-4	33
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-13	50
WINTERGREEN *(Pyrola asarifolia)*	4	0-22	33
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	12	0-63	50
MARSH REEDGRASS *(Calamagrostis canadensis)*	3	0-86	17
TWO SEEDED SEDGE *(Carex disperma)*	3	0-18	17

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC-MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1308(1070-1539) M

SOIL DRAINAGE:
WELL

SLOPE:
26(0-65)%

ASPECT:
SOUTHWEST

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION KG/HA

TOTAL 750 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
3 HA /AUM (0.13 AUM/AC)

MONTANE SUBREGION

BANFF AND JASPER MOUNTAIN ECODISTRICTS

YA HA TINDA AREA

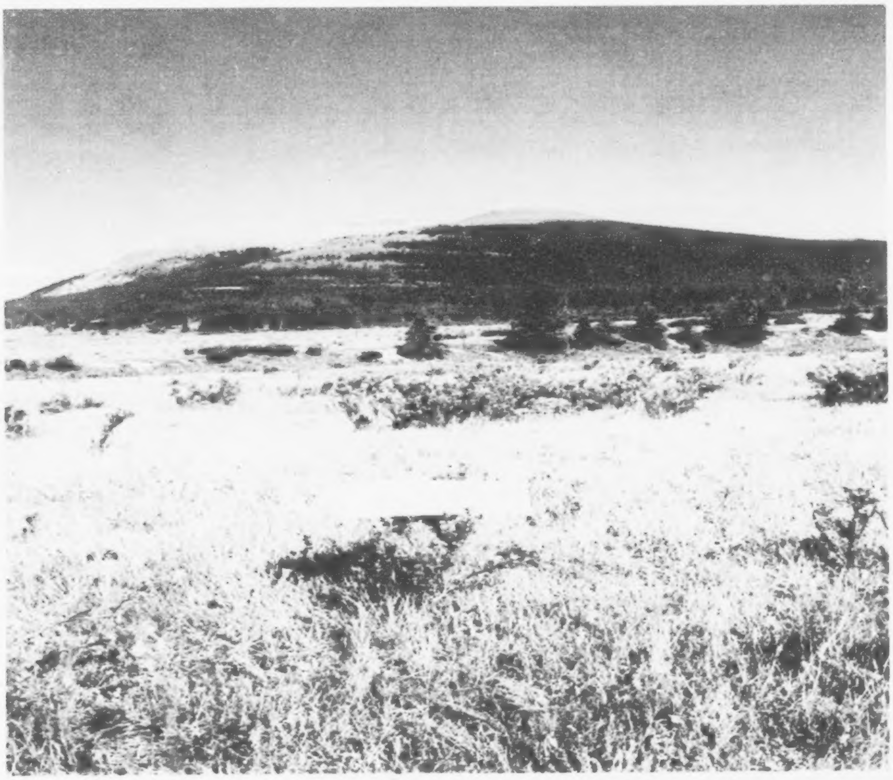

Photo 3: Banff and Jasper Mountain ecodistricts. This is a typical grassland of south-facing slopes and meadows in the Ya Ha Tinda. These grasslands are transitional between the grasslands described in Banff and Jasper National Parks and the Morley and Blairmore Foothills ecodistricts.

A9. Tufted hairgrass-Sedge

(Deschampsia cespitosa-Carex praegracilis)

n=1 This community type is located on moist sites that are better drained than pure sedge meadows. Willoughby (1992) and Willoughby (1999), found that tufted hairgrass is a common plant species on these lowland sites throughout the Upper Foothills and lower Subalpine subregions. The presence of this community type in the Ya Ha Tinda indicates that many of the grasslands in this area are transitional to the Upper Foothills and Subalpine subregions. Morgantini and Russell (1983), found that elk preferred the rough fescue dominated areas over these tufted hairgrass dominated communities at Ribbon flats just west of the Ya Ha Tinda. As a result this community type would be rated as secondary or non-use range for elk and horses in the Ya Ha Tinda area.

PLANT COMPOSITION CANOPYCOVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	-	100
FORBS			
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	8	-	100
YARROW *(Achillea millefolium)*	3	-	100
CHICKWEED *(Cerastium arvense)*	2	-	100
ELEPHANT'S HEAD *(Pedicularis groenlandica)*	2	-	100
GRASSES			
GRACEFUL SEDGE *(Carex praegracilis)*	39	-	100
TUFTED HAIRGRASS *(Deschampsia cespitosa)*	12	-	100
SEDGE SPP. *(Carex spp.)*	9	-	100
HAIRY WILDRYE *(Elymus innovatus)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1640(1600-1700) M

SOIL DRAINAGE:
WELL

SLOPE:
9(1-20)%

ASPECT:
SOUTHWESTERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION

GRASS	1208
FORB	98
TOTAL	1256

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.1HA/AUM or
0.35 AUM/AC

A10. Bog birch/Sedge-Rough fescue

(Betula glandulosa/Carex spp.-Festuca scabrella)

n=1 This community type represents the invasion of bog birch onto the rough fescue grasslands. This community type is found scattered throughout the grasslands in the Ya Ha Tinda on slightly moister sites. It also appears to be transitional to many of the forested stands in the area. This community type is very similar to the Bog birch/Rough fescue community type described by Willoughby (2001) in the Upper Foothills subregion. They felt that the lack of fire on this community type allowed bog birch cover to expand, reducing forage productivity for wildlife and domestic livestock. In one study, burning bog birch twice in 3 year intervals controlled birch growth and increased total forage production by over 40% compared to the unburned control (Bork 1990).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
BOG BIRCH *(Betula glandulosa)*	30	-	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	7	-	100
FORBS			
YARROW *(Achillea millefolium)*	3	-	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	2	-	100
CUT LEAVED ANEMONE *(Anemone multifida)*	4	-	100
HEART LEAVED ALEXANDERS *(Zizia aptera)*	4	-	100
OLD MAN'S WHISKERS *(Geum triflorum)*	3	-	100
AMERICAN VETCH *(Vicia americana)*	3	-	100
GRASSES			
SEDGE SPP. *(Carex spp.)*	12	-	100
ROUGH FESCUE *(Festuca scabrella)*	2	-	100
SHEEP FESCUE *(Festuca sacimontana)*	4	-	100
JUNEGRASS *(Koeleria macrantha)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1476 M

SOIL DRAINAGE:
WELL

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION KG/HA

GRASS	592
FORB	198
SHRUB	12
TOTAL	802

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.7 HA/AUM OR
0.23 AUM/AC

A11. Rough fescue-Fringed brome-Sedge

(Festuca scabrella-Bromus ciliatus-Carex spp.)

n=5 This community type represents coarse textured fluvial areas and moister south and west facing slopes. The increased moisture on these spots favours the growth of fringed brome. On the drier south and west facing slopes these grasslands are dominated by rough fescue, sedge and junegrass. The forage production on this community type tends to be slightly higher than the Rough fescue-Sedge-Junegrass dominated community type. Making this community type one of the most important foraging areas for wildlife. The rough fescue grasslands in the Ya Ha Tinda area are extensively utilized by elk and domestic horses. It is not clear how this heavy grazing pressure has affected the species composition of these grasslands. It is likely that rough fescue cover would increase if the grazing pressure was reduced on these grasslands (Willoughby 1992).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL. *(Potentilla fruticosa)*	2	0-2	80
FORBS			
EARLY YELLOW LOCOWEED *(Oxytropis sericea)*	7	1-27	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	0-3	100
OLD MAN'S WHISKERS *(Geum triflorum)*	10	0-20	80
ALPINE HEDYSARUM *(Hedysarum alpinum)*	3	0-9	80
YARROW *(Achillea millefolium)*	3	0-8	60
SHOWY LOCOWEED *(Oxytropis splendens)*	2	0-6	60
CUT LEAVED ANEMONE *(Anemone multifida)*	2	0-3	60
GRASSES			
JUNEGRASS *(Koeleria macrantha)*	3	1-6	100
FRINGED BROME *(Bromus ciliatus)*	10	2-17	100
THREAD-LEAVED SEDGE *(Carex filifolia)*	9	1-10	100
ROUGH FESCUE *(Festuca scabrella)*	8	4-11	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC-SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1640(1600-1700) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
6(0-20)%

ASPECT:
SOUTH TO WESTERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION KG/HA

GRASS	802(560-1006)
FORB	322(130-674)
SHRUB	82(0-350)
TOTAL	1207(804-1740)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.1 (1.7-0.8) HA/AUM or
0.35 (0.23-0.5) AUM/AC

A12. Rough fescue-Sedge-Junegrass

(Festuca scabrella-Carex filifolia-Koeleria macrantha)

n=2 This community type is distinguished from the other rough fescue dominated community type by the lack of fringed brome and the increased cover of junegrass. This community type tends to occupy steeper, morainal and colluvial slopes and and has a drier moisture regime than the previously described rough fescue community type. Morgantini and Russell (1983) found that the rough fescue dominated community types were the primary foraging areas for elk. As a result this community type should be rated as primary range. The rough fescue grasslands in the Ya Ha Tinda area are extensively utilized by elk and domestic horses. It is not clear how this heavy grazing pressure has affected the species composition of these grasslands. It is likely rough fescue cover would increase if the grazing pressure was reduced on these grasslands (Willoughby 1992).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	1-4	100
FORBS			
EARLY YELLOW LOCOWEED *(Oxytropis sericea)*	10	7-12	100
WOOLY EVERLASTING *(Antennaria lanata)*	1	2-3	100
OLD MAN'S WHISKERS *(Geum triflorum)*	6	0-12	50
FALSE DANDELION *(Agoseris glauca)*	1	0-2	100
GRASSES			
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	3	2-3	100
JUNEGRASS *(Koeleria macrantha)*	7	3-10	100
ROUGH FESCUE *(Festuca scabrella)*	13	7-18	100
THREAD LEAF SEDGE *(Carex filifoliaspp.)*	5	5-5	100
HAIRY WILDRYE *(Elymus innovatus)*	2	0-4	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
MESOTROPHIC-SUBMESOTROPHIC

ELEVATION:
1625 (1600-1650) M

SOIL DRAINAGE:
RAPIDLY
SLOPE:
23(10-35)%
ASPECT:
SOUTH TO WEST
PARENT MATERIAL:
MORAINAL, COLLUVIAL
ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION KG/HA

GRASS	584(514-654)
FORB	228(156-300)
SHRUB	69(24-114)
TOTAL	881(834-928)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (1.5-1.6) HA/AUM OR
0.27 (0.25-0.27) AUM/AC

A13. Sedge-Junegrass

(Carex filifolia-Koeleria macrantha)

n=2 This community type was described on the west side of the Ya Ha Tinda ranch. It is closer to the ranch buildings and therefore is more extensively utilized by horses. It was described on coarse textured fluvial areas. The parent material and ecological conditions are similar to the Rough fescue-Fringed brome-Sedge dominated community type. It appears that the heavier grazing pressure on this community type causes rough fescue to decline and allows sedge and junegrass to increase. The forage production on this community type is about half of the rough fescue dominated community types, indicating that some type of rest would benefit this grassland.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUB			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	8	5-9	100
FORBS			
EARLY YELLOW LOCOWEED *(Oxytropis sericera)*	2	0-3	100
THREE FLOWERED AVENS *(Geum trifolium)*	2	1-2	100
CUT LEAVED ANEMONE *(Anemone multifida)*	3	2-3	100
SHOWY LOCOWEED *(Oxytropis splendens)*	3	0-6	100
FRINGED SAGE *(Artemisia frigida)*	1	0-2	50
WHITE CAMAS *(Zigadenus elegans)*	1	0-2	50
GRASSES			
SEDGE SPP. *(Carex spp.)*	6	6-6	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	2-4	100
JUNEGRASS *(Koeleria macrantha)*	5	4-6	100
SHEEP FESCUE *(Festuc saximontana)*	3	1-4	100
LICHEN	7	1-12	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1477(1474-1480) M

SOIL DRAINAGE:
RAPIDLY

ECOLOGICAL STATUS SCORE:16-8

FORAGE PRODUCTION KG/HA

GRASS	451 (90-884)
FORB	71(2-200)
SHRUB	5(2-10)
TOTAL	520(292-906)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.6 (1.5-4.7) HA/AUM OR
0.16 (0.08-0.27) AUM/AC

A14. Creeping red fescue-Timothy

(Festuca rubra-Phleum pratense)

n=2 This community type represents spruce cutblocks that were harvested and seeded to creeping red fescue and timothy. This seeding was done in order to increase the forage supply for wintering elk and alleviate the pressure on the rough fescue dominated grasslands around the Ya Ha Tinda ranch. This seeding has increased the forage supply of the area, but it has been found that elk do not perfer to graze these sites. The agronomic species seeded into these cutblocks have also been found to be invasive (Gerling et al. 1996). Further range improvement should probably be done with a native seed mix.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW SPP. *(Salix spp.)*	2	0-2	100
FORBS			
TALL LARKSPUR *(Delphinium glaucum)*	1	0-2	50
FIREWEED *(Epilobium angustifolium)*	2	0	50
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	2	0-3	50
CREEPING RED FESCUE *(Festuca rubra)*	18	15-21	100
HAIRY WILDRYE *(Elymus innovatus)*	10	8-11	100
TIMOTHY *(Phleum pratense)*	8	7-9	100
SEDGE SPP. *(Carex spp.)*	6	1-11	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1593(1565-1620) M

SOIL DRAINAGE:
WELL TO IMPERFECTLY

SLOPE:
40(35-45)%

ECOLOGICAL STATUS SCORE: MODIFIED OR TAME

FORAGE PRODUCTION KG/HA

TOTAL 1500

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.9 HA/AUM OR
0.45 AUM/AC

MONTANE SUBREGION
BLAIRMORE AND MORLEY FOOTHILLS ECODISTRICTS
GRASSLAND COMMUNITY TYPES

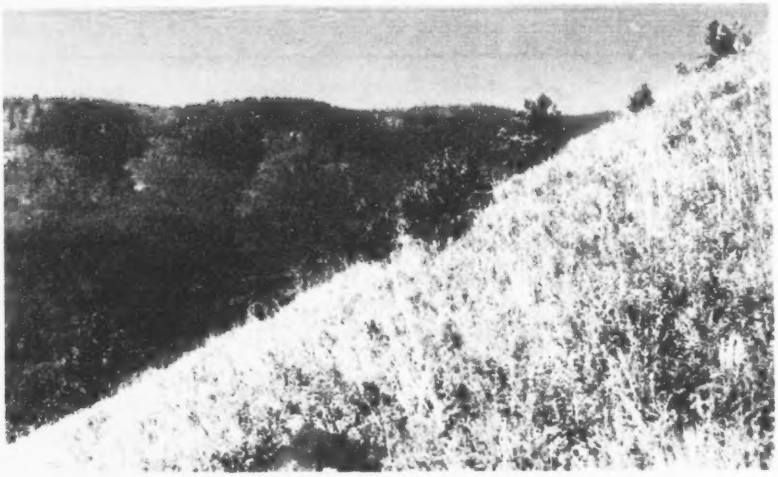

Photo 4. Blairmore Foothills ecodistrict: This represents a Rough fescue-Sedge/Bearberry grassland found on a wind-swept, steep, south-facing slope where the moisture regime is submesic to subxeric. The harsh environmental conditions favour the growth of Limber pine.

Photo 5. Blairmore Foothills ecodistrict: This is a moderately-grazed Idaho fescue-Parry oatgrass-Rough fescue grassland. This community type is highly diverse as a result of light to moderate grazing. Under long-term, heavy grazing, diversity would decline as Kentucky bluegrass and dandelion became the dominant species.

B1. Rough fescue-Idaho fescue-Parry oatgrass

(Festuca scabrella-Festuca idahoensis-Danthonia parryii)

n=106 This community appears to be the modal grassland community type on Black Chernozemic soils in the foothills of southern Alberta from an elevation of 1300m up to 1900m on isolated sites. Willoughby (1992), described one Rough fescue-dominated site where the species composition had not changed in over 30 years, indicating this maybe the climax community type on river terraces and south facing slopes in the Montane. Indeed Moss and Campbell (1947), found that rough fescue grows almost to the exclusion of other plants in the absence of disturbance. On rocky and gravelly slopes with shallow soils, rough fescue is replaced by Parry oatgrass and Idaho fescue. They also found Parry oatgrass and Idaho fescue increased and rough fescue declined with increased grazing pressure. Willoughby (1992), also described rough fescue and Idaho fescue dominated community types with little Parry oatgrass in the Castle area south of Blairmore. He also found that rose and shrubby cinquefoil tended to increase in cover at higher elevations in these grasslands. In this guide it was difficult and impractical to distinguish these community types. Consequently, the Rough fescue, Rough fescue-Idaho fescue and Rough fescue-Parry oatgrass/Shrubby cinquefoil-Rose community types listed in Willoughby (1992) are grouped into this one large community type.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-25	61
FORBS			
OLD MAN'S WHISKERS *(Geum triflorum)*	4	0-24	60
YELLOW BEARDTONGUE *(Penstemon confertus)*	3	0-28	52
CUT LEAVED ANEMONE *(Anemone multifida)*	2	0-13	67
WOOLY GROMWELL *(Lithosperma ruderale)*	T	0-6	28
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	2	0-15	49
MOUNTAIN SHOOTING STAR *(Dodecatheon conjugens)*	1	0-21	52
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	29	13-61	100
IDAHO FESCUE *(Festuca idahoensis)*	8	0-48	92
PARRY OATGRASS *(Danthonia parryi)*	10	0-27	81
BLUNT SEDGE *(Carex obtusata)*	4	0-24	47

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC-MESIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC
ELEVATION:
1587(1370-2121) M
SOIL DRAINAGE:
WELL TO MODERATELY WELL
SLOPE :
19(2-65)%
ASPECT:
SOUTHERLY-WESTERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1346(304-4144)
FORB	519(0-2378)
SHRUB	98(0-924)
TOTAL	1933(810-4838)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.5 (0.5-0.65) HA/AUM OR
0.8 (0.8-0.64) AUM/AC

B2. Idaho fescue-Parry oatgrass-Rough fescue

(Festuca idahoensis-Danthonia parryi-Festuca scabrella)

n=56 This community type is found upslope from the Rough fescue-Parry oatgrass-Idaho fescue community type (Figure 1) and can be dominated by Idaho fescue or Parry oatgrass. As one moves upslope to drier conditions there is a shift in species composition from rough fescue to Parry oatgrass and Idaho fescue. Under grazing pressure Parry oatgrass, Idaho fescue and rough fescue decline and upland sedge increases (Willoughby 1992). On drier sites within this community type juniper and bearberry cover can be extensive. Increased grazing pressure on the drier sites will lead to an increase in low growing forbs (little clubmoss, moss phlox) and sedges.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-14	54
PRICKLY ROSE *(Rosa acicularis)*	2	0-15	57
FORBS			
YARROW *(Achillea millefolium)*	2	0-11	94
OLD MAN'S WHISKERS *(Geum triflorum)*	3	0-18	48
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	3	0-14	64
WOOLY GROMWELL *(Lithosperma ruderale)*	1	0-2	45
CUT LEAVED ANEMONE *(Anemone multifida)*	3	0-11	79
GRASSES			
PARRY OATGRASS *(Danthonia parryi)*	18	0-51	84
ROUGH FESCUE *(Festuca scabrella)*	10	0-30	96
IDAHO FESCUE *(Festuca idahoensis)*	14	0-63	96
BLUNT SEDGE *(Carex obtusata)*	3	0-22	55
JUNEGRASS *(Koeleria macrantha)*	3	0-18	87

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
SUBXERIC-MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC TO MESOTROPHIC

ELEVATION:
1558(1330-1848) M

SOIL DRAINAGE:
RAPIDLY-WELL

SLOPE:
20(0-45)%

ASPECT:
SOUTHERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	651(148-2026)
FORB	353(10-838)
SHRUB	55(0-248)
TOTAL	1363(594-2446)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.7 (0.62-0.81) HA/AUM OR
0.57 (0.65-0.5) AUM/AC

B3. Bluebunch wheatgrass-Sedge

(Agropyron spicatum-Carex obtusata)

n=27 Bluebunch wheatgrass dominated sites are found on well-drained, south facing-slopes in the Montane subregion throughout southern Alberta (Strong 1992). This dominant species is abundant in the interior of southern British Columbia, where it is codominant with big sagebrush (*Artemisia tridentata*) at lower elevations and rough fescue at higher elevations (Tisdale 1947). Increased grazing pressure on the drier sites leads to a decline in bluebunch wheatgrass and allows low growing forbs and sedge species to increase. On sites with big sagebrush in British Columbia bluebunch wheatgrass decreases and big sagebrush will increase with increased grazing pressure (Tisdale 1947). Forage production on this type can vary from 700 kg/ha on dry sites to over 2000 kg/ha on moister sites.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	8	0-31	92
WESTERN SNOWBERRY *(Symphoricarpos occidentalis)*	8	0-41	63
FORBS			
YELLOW BEARDSTONGUE *(Penstemon confertus)*	1	0-24	44
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	4	0-28	63
COMMON STRAWBERRY *(Fragaria virginiana)*	2	0-17	33
BEARBERRY *(Arctostaphylos uva-ursi)*	5	0-21	41
FRINGED SAGE *(Artemisia frigida)*	3	0-12	48
GRASSES			
JUNEGRASS *(Koeleria macrantha)*	9	0-22	92
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	1	0-17	37
BLUNT SEDGE *(Carex obtusata)*	3	0-21	26
BLUEBUNCH WHEATGRASS *(Agropyron spicatum)*	17	4-43	100
ROUGH FESCUE *(Festuca scabrella)*	5	0-29	73

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC-SUBMESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1630(1394-1848) M

SOIL DRAINAGE:
RAPIDLY TO VERY RAPIDLY

SLOPE:
46(0-65)%

ASPECT:
SOUTH TO WESTERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG\HA)

GRASS	760(396-1178)
FORB	457(0-1170)
SHRUB	238(0-626)
TOTAL	1456(612-2660)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2 (0.75-3.5) HA/AUM OR
0.2 (0.55-0.12) AUM/AC

B4. Rough fescue-Sedge/Bearberry

(Festuca scabrella-Carex obtusata/Arctostaphylos uva-ursi)

n=49 This community appears to be characteristic of dry grass meadows on hilltops throughout the Montane subregion. It is similar to the Rough fescue-Sedge community type described by Willoughby (1992) on hilltops in the Porcupine Hills. The shallow poorly developed soils appear to favour rough fescue, slender wheatgrass and sedge over Parry oatgrass. This community is drier than the Rough fescue grasslands characteristic of lower slope positions, but is moister than the bluebunch wheatgrass plant community that is associated with dry southerly slopes. This community type can be invaded by aspen to form the Aspen/Saskatoon/Sedge, Pl/Bearberry-Juniper or Fd/Hairy wildrye community types. The transition community between the forest and grassland may resemble the Pinegrass-Hairy wildrye or Saskatoon-Rose-Snowberr/Bearberry community types.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	2	0-14	50
CREEPING JUNIPER *(Juniprus horizontalis)*	2	0-24	22
SNOWBERRY *(Symphoricarpos occidentalis)*	1	0-6	31
SASKATOON *(Amelanchier alnifolia)*	3	0-16	69
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	33	0-77	97
FRINGED SAGE *(Artemisia frigida)*	1	0-5	11
MOSS PHLOX *(Phlox hoodii)*	1	0-8	13
CUT LEAVED ANEMONE *(Anemone multifida)*	3	0-21	90
STRAWBERRY *(Fragaria virginiana)*	3	0-19	74
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	23	5-54	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	3	0-34	39
JUNEGRASS *(Koeleria macrantha)*	2	0-14	80
BLUNT SEDGE *(Carex obtusata)*	4	0-21	43
IDAHO FESCUE *(Festuca idahoensis)*	4	0-18	76
PARRY OATGRASS *(Danthonia parryi)*	5	0-37	59

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC-MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1669(1341-2134)M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
28(7-58)%

ASPECT:
SOUTH TO WEST

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG/HA)

GRASS	780(0-2184)
FORB	537(0-1684)
SHRUB	557(0-2972)
TOTAL	1875(236-3478)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (0.75-3.5 HA/AUM OR
0.27 (0.55-0.12) AUM/ac

B5. Big sagebrush/Bluebunch wheatgrass-Sedge

(Artemisia tridentata/Agropyron spicatum-Carex spp.)

n=4 This community type is rare in Alberta and is isolated on gravelly south facing slopes in the Montane subregion south of Blairmore. This community type is similar to the Pacific Northwest Bunchgrass type described by Tisdale (1982) in Washington and British Columbia. The big sagebrush, bluebunch wheatgrass community types found in these areas are located on Dark Brown and Dk Gray Chernozemic soils, with glacial till parent material (Green and van Ryswyk 1982). Tisdale (1982), found that there is little known about the environmental factors which determine the presence of sagebrush-grass versus true grassland. Therefore, it is not clear why these south facing slopes are dominated by sagebrush and not a bluebunch wheatgrass community type. It is known that increased grazing pressure on a Big sagebrush/Bluebunch wheatgrass in British Columbia will allow big sagebrush to increase in cover, but heavy grazing pressure does not seem to be a factor in the formation of this community type in Alberta.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
BIG SAGEBRUSH *(Artemisia tridentata)*	21	7-45	100
FORBS			
LITTLE CLUBMOSS *(Selaginella densa)*	5	0-15	75
BEARBERRY *(Arctostaphylos uva-ursi)*	22	0-58	75
SMALL-LEAVED EVERLASTING *(Antennaria parviflora)*	1	1-2	100
NODDING ONION *(Allium cernuum)*	1	0-1	75
STICKY ALUMROOT *(Heuchera cylindrica)*	1	0-4	25
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	2	1-4	100
GRASSES			
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	1	0-1	25
BLUEBUNCH WHEATGRASS *(Agropyron spicatum)*	5	2-13	75
IDAHO FESCUE *(Festuca idahoensis)*	8	6-13	75
JUNEGRASS *(Koeleria macrantha)*	3	2-4	75
BLUNT SEDGE *(Carex obtusata)*	1	0-1	25

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
SUBXERIC-MESIC

NUTRIENT REGIME :
SUBMESOTROPHIC

ELEVATION:
1550(1470-1680) M

SOIL DRAINAGE :
RAPIDLY TO WELL

SLOPE:
39(35-40)%

ASPECT:
SOUTH AND WEST

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	180
FORB	250
SHRUB	276
TOTAL	706

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2 (0.75-3.5) HA/AUM OR
0.2 (0.55-0.12) AUM/AC

B6. Saskatoon-Rose-Snowberry/Bearberry

(Amelanchier alnifolia-Rosa acicularis-Symphoricarpos occidentalis/Arctostaphylos uva-ursi)

n=32 This community type represents the ecotone between rough fescue dominated grasslands and Douglas fir and lodgepole pine dominated forests on dry south facing slopes. The presence of shrubs (saskatoon, rose, snowberry) and the grass species (hairy wildrye, pinegrass) indicate the transition from rough fescue grasslands to a forested community type. This community type appears to occur at higher elevations (>1500m) and may reflect the dominance of trees at the higher altitudes. Forage production declines rapidly moving from the grassland into the forests. This community type has half the production (1100 kg/ha) of rough fescue dominated grasslands (2200 kg/ha). The increase in tree canopy cover results in a further decline in forage production to approximately 600 kg/ha.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE (*Pinus contorta*)	1	0-20	16
ASPEN (*Populus tremuloides*)	3	0-34	34
SHRUBS			
SHRUBBY CINQUEFOIL (*Potentilla fruticosa)*	2	0-9	56
SNOWBERRY (*Symphoricarpos occidentalis*)	1	0-7	50
SASKATOON (*Amelanchier alnifolia*)	6	0-52	78
PRAIRIE ROSE , PRICKLY ROSE (*Rosa arkansana, R. acicularis)*	5	0-25	94
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	23	3-78	100
SILKY PERENNIAL LUPINE *(Lupinus sericeus*)	2	0-16	53
CUT LEAVED ANEMONE *(Anemone multifida)*	2	0-10	75
SMOOTH ASTER *(Aster laevis*)	2	0-17	50
STRAWBERRY *(Fragaria virginiana*)	4	0-6	66
GRASSES			
ROUGH FESCUE (*Festuca scabrella*)	8	0-25	78
JUNEGRASS (*Koeleria macrantha*)	4	0-9	84
BLUNT SEDGE (*Carex obtusata*)	6	0-61	50
HAIRY WILDRYE (*Elymus innovatus*)	4	0-44	47
PINEGRASS (*Calamagrostis rubescens*)	5	0-29	53

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
XERIC-SUBMESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1602(1375-1981) M

SOIL DRAINAGE :
VERY RAPIDLY TO WELL

SLOPE (RANGE):
26(1-72)%

ASPECT:SOUTHERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	572(232-1594)
FORB	570(106-930)
SHRUB	240(0-400)
TOTAL	1335(842-2706)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (0.75-3.5) HA/AUM OR
0.23 (0.55-0.12) AUM/AC

B6a. Snowberry-Rose-Saskatoon

(Symphoricarpos occidentalis-Rosa acicularis-Amelanchier alnifolia)

n=27 This community type represents moist pockets of shrubland in gullies and depressional areas within rough fescue dominated grasslands. This community type is very similar to the previously described Saskatoon-Rose-Snowberry/Bearberry dominated community type, but this site is moister and lacks the cover of bearberry. These sites will eventually become invaded by aspen to form the Aw/Snowberry or Aw/Rose/Pinegrass dominated community types.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-9	30
SNOWBERRY (*Symphoricarpos occidentalis*)	7	0-7	74
SASKATOON (*Amelanchier alnifolia*)	6	0-32	63
PRAIRIE ROSE , PRICKLY ROSE (*Rosa arkansana, R. acicularis)*	2	0-25	22
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	T	0-1	7
SILKY PERENNIAL LUPINE *(Lupinus sericeus*)	4	0-26	70
CUT LEAVED ANEMONE *(Anemone multifida)*	1	0-8	63
SMOOTH ASTER *(Aster laevis*)	1	0-8	44
STRAWBERRY *(Fragaria virginiana*)	3	0-22	52
WILD BERGAMONT (*Monarda fistulosa*)	2	0-25	33
GRASSES			
ROUGH FESCUE (*Festuca scabrella*)	4	0-15	70
JUNEGRASS (*Koeleria macrantha*)	6	0-9	78
BLUNT SEDGE (*Carex obtusata*)	6	0-61	19
IDAHO FESCUE (*Festuca idahoensis*)	7	0-25	59

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
SUBXERIC-MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1563(1375-1768) M

SOIL DRAINAGE :
VERY RAPIDLY TO WELL

SLOPE (RANGE):
33(2-55)%

ASPECT:SOUTHERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	879(268-1298)
FORB	543(0-1466)
SHRUB	136(0-416)
TOTAL	1303(600-2560)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (1-3.5) HA/AUM OR
0.23 (0.55-0.12) AUM/AC

B7. Pinegrass-Hairy wildrye/Strawberry

(Calamagrostis rubescens-Elymus innovatus/Fragaria virginiana)

n=11 This community type represents the transition from grassland to forest on moist sites with northerly aspects. It appears this community occurs in areas that have some seepage throughout the growing season. There is usually high forb cover on these sites with strawberry, showy aster, American vetch, peavine and silky perennial lupine being common. Pinegrass and hairy wildrye are the common grass species in the understory of conifer and deciduous stands and their dominance in this community type may indicate a transition to a forested community. The high moisture content of these sites allows for production of over 2000 kg/ha.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	T	0-1	9
SHRUBS			
DWARF BILBERRY *(Vaccinium caespitosum)*	1	0-5	18
SNOWBERRY *(Symphoricarpos occidentalis)*	2	0-6	36
PRICKLY ROSE *(Rosa acicularis)*	2	0-5	46
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	0-10	55
FORBS			
STRAWBERRY *(Fragaria virginiana)*	13	1-32	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	4	0-13	91
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	5	0-20	55
SHOWY ASTER *(Aster conspicuus)*	5	0-20	73
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	23	3-66	100
HAIRY WILD RYE *(Elymus innovatus)*	7	0-48	36
NORTHERN AWNLESS BROME *(Bromus pumpellianus)*	1	0-3	9

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
MESIC-SUBHYGRIC

NUTRIENT REGIME :
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1514(1364-1640) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
25(2-46)%

ASPECT:
NORTHERLY, WEST, EAST

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1487(1058-1916)
FORB	1003(858-1148)
TOTAL	2260(1800-3064)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.75 (0.5-1) HA/AUM OR
0.55 (0.8-0.4) AUM/AC

B8.Douglas fir/Idaho fescue-Rough fescue

(Pseudotsuga menziesii/Festuca idahoensis-Festuca scabrella)

n=5 This community type represents the transition from grassland to a Douglas fir dominated forest. The factors responsible for the differences between forest and grassland maybe climatic, with cooler and moister conditions favouring forest, it could be edaphic with grasslands found on drier and shallower soils or lack of disturbance from fire which favours the growth of trees. Extensive overlap of the forests and grassland will occur in the Montane because of the variable soils and topography.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	14	1-18	100
LODGEPOLE PINE *(Pinus contorta)*	2	0-5	60
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	4	0-10	80
WHITE MEADOWSWEET *(Spiraea betulifolia)*	4	0-15	40
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	10	0-32	80
NORTHERN BEDSTRAW *(Galium boreale)*	1	1-2	100
WILD STRAWBERRY *(Fragaria virginiana)*	4	1-5	100
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	4	0-10	80
BALSAMROOT *(Balsamorhiza sagittata)*	2	0-4	60
GRASSES			
IDAHO FESCUE *(Festuca idahoensis)*	26	1-60	100
ROUGH FESCUE *(Festuca scabrella)*	26	13-60	100
PINEGRASS *(Calamagrostis rubescens)*	1	0-2	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1562 (1554-1710) M

SOIL DRAINAGE:
WELL

SLOPE:
14(0-30)%

ASPECT:
SOUTHWEST

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG/HA)

GRASS	565(320-810)
FORB	238(180-296)
SHRUB	1592(1568-1616)
TOTAL	2395(2232-2558)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.71 (0.6-0.8) HA /AUM OR
0.56 (0.65-0.5) AUM/AC

B9.Douglas fir/Idaho fescue-Sandberg bluegrass

(Pseudotsuga menziesii/Festuca idahoensis-Poa sandbergii)

n=1 This community type is similar to the Douglas fir/Idaho fescue-Rough fescue community type and represents the transition from grassland to forest, but this type is drier and has shallower soils than the Douglas fir/Idaho fescue-Rough fescue community type. Little clubmoss, fringed sage, Sandberg bluegrass and junegrass are all well adapted to dry, rapidly drained sites. Johnston (1981), described a Sandberg bluegrass/Bluebunch wheatgrass type on dry sites with extremely shallow soils in Oregon and Tisdale (1982) described Sandberg bluegrass on dry sites with fine textured soils in British Columbia. It is also possible that increased grazing pressure may also account for the high cover of Sandberg bluegrass. Mueggler and Stewart (1980), found Sandberg bluegrass increased with grazing pressure on dry grasslands in Montana.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR			
(Pseudotsuga menziesii)	5	-	100
SHRUBS			
CREEPING JUNIPER			
(Juniperus communis)	1	-	100
WHITE MEADOWSWEET			
(Spiraea betulifolia)	2	-	100
FORBS			
LITTLE CLUBMOSS			
(Selaginella densa)	5	-	100
DANDELION			
(Taraxacum offincinale)	3	-	100
CUT LEAVED ANEMONE			
(Anemone multifida)	2	-	100
BALSAMROOT			
(Balsamorhiza sagitata)	2	-	100
GRASSES			
IDAHO FESCUE			
(Festuca idahoensis)	30	-	100
SANDBERG BLUEGRASS			
(Poa sandbergii)	30	-	100
JUNEGRASS			
(Koeleria macrantha)	10	-	100
BLUEBUNCH WHEATGRASS			
(Agropyron spicatum)	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1493 M

SOIL DRAINAGE:
WELL

SLOPE:
33%

ASPECT:
SOUTHWEST

ECOLOGICAL STATUS SCORE: 16

FORAGE PRODUCTION (KG/HA)

TOTAL	1750 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.8 (0.75-1) HA /AUM OR
0.5 (0.55-0.4) AUM/AC

B10. Aw/Strawberry/Rough fescue

(Populus tremuloides/Fragaria virginiana/Festuca scabrella)

n=2 This community type represents the transition from a rough fescue dominated grassland to an aspen dominated forest. Aspen has invaded onto the grassland and the species composition of the understory is slowly succeeding to species characteristic of aspen stands such as strawberry and slender wheatgrass.

This community type is much moister than the Douglas fir transition forests previously described. Aspen favors the moist draws and north-facing slopes throughout the foothills of southern Alberta. As one moves west into the mountains and the Subalpine subregion, aspen tends to grow very poorly, and the aspen stands are characterized by stunted, twisted trees that have low vigour. Forage production on the grasslands declines rapidly when aspen invades; from a high of 2000 kg/ha to a low of 1000 kg/ha.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	4	1-5	100
FORBS			
STRAWBERRY			
(Fragaria virginiana)	11	5-17	100
YELLOW PENSTEMON			
(Penstemon confertus)	4	2-5	100
STICKY PURPLE GERANIUM			
(Geranium viscosissimum)	6	5-6	100
GRACEFUL CINQUEFOIL			
(Potentilla gracilis)	4	1-6	100
CANADA THISTLE			
(Cirsium arvense)	3	0-6	50
GRASSES			
ROUGH FESCUE			
(Festuca scabrella)	27	24-29	100
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	5	4-5	100
SEDGE SPP.			
(Carex spp.)	2	1-4	100
PINEGRASS			
(Calamagrostis rubescens)	6	0-11	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBHYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1524(1463-1585) M

SOIL DRAINAGE:
MODERATELY WELL

SLOPE:
11(10-12)

ASPECT:
SOUTH AND EAST

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1170
FORB	1206
TOTAL	2376

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (1.2-3) HA /AUM OR
0.27 (0.35-0.12) AUM/AC

B11. Thimbleberry

(Rubus parviflorus)

n=3 This community type is characteristic of nutrient-rich seepage areas throughout the Montane. This community is very similar to the Aw-Pb/Thimbleberry and Lodgepole pine/Thimbleberry community types described later in the guide, but it is not as successional advanced.

Forage production of this community type is very high because of the high moisture and nutrient content of the soil, but the thick cover of thimbleberry which is generally unpalatable to livestock at proper stocking levels limits access. As a result this community type should be rated as non-use range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	58	52-63	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	10	2-14	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	1-9	100
SHOWY ASTER *(Aster conspicuus)*	7	4-10	100
FIREWEED *(Epilobium angustifolium)*	4	3-4	100
BANEBERRY *(Actaea rubra)*	3	0-10	33
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	9	0-26	33
FOWL BLUEGRASS *(Poa palustris)*	1	1-2	100
FRINGED BROME *(Bromus ciliatus)*	1	0-1	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1640(1500-1860) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
35(10-50)%

ASPECT:
VARIABLE

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	2190
FORB	256
SHRUB	186
TOTAL	2632

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.5 (1.2-4.4) HA /AUM OR
0.18 (0.35-0.08) AUM/AC

B12. Beaked-Water sedge

(Carex rostrata, C. aquatilis)

n=8 This community type is found in all subregions of Alberta. Wet conditions and periodic flooding result in the formation of sedge meadows. Bog birch and willow will invade into the drier edges of these meadows to form the Willow/Sedge and Bog birch /Sedge community types.

These community types are quite productive producing nearly 2000 kg/ha of forage, but the high water table in the spring and summer when these meadows are most palatable limits livestock use. A study in the Yukon found that crude protein on these meadows declined from a high of 10% in May to less than 5% in September (Bailey et al. 1992). As a result, these meadows would be rated as secondary or non-use range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW SPP. *(Salix spp.)*	1	0-2	63
FORBS			
PURPLE AVENS *(Geum rivale)*	2	0-16	13
SMOOTH ASTER *(Aster laevis)*	1	0-8	13
SWAMP HORSETAIL *(Equisetum fluviatile)*	1	0-11	13
FIREWEED *(Epilobium angustifolium)*	1	0-3	25
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	53	0-97	88
WATER SEDGE *(Carex aquatilis)*	19	0-70	50
BALITIC RUSH *(Juncus baliticus)*	4	0-21	25
MARSH REEDGRASS *(Calamagrostis canadensis)*	3	0-17	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC-SUBHYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1447(1400-1500) M

SOIL DRAINAGE:
IMPERFECTLY, POORLY

SLOPE:
1%

ASPECT:
NORTHERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	2298
FORB	608
TOTAL	2906

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.4 (0.3-0.5) HA /AUM OR
1 (1.3-0.8) AUM/AC

B12a. Awned sedge

(Carex atherodes)

n=3 This community type is found in all subregions of Alberta. Wet conditions and periodic flooding result in the formation of sedge meadows. Bog birch and willow will invade into the drier edges of these meadows to form the Willow/Sedge and Bog birch /Sedge dominated community types. Thompson and Hansen (2002) described this community on the eastern edges of the Montane subregion. They found this community in lentic situations around depressional wetlands, sloughs, potholes on sites that were generally more alkaline than the Beaked and Water Sedge dominated meadows. Willoughby (2001) has found this sedge species to be very palatable to livestock in the Upper Foothills subregion. If the sites dry out they can be extensively utilized by livestock.

These community types are quite productive producing nearly 2000 kg/ha of forage, but the high water table in the spring and summer when these meadows are most palatable limits livestock use. A study in the Yukon found that crude protein on these meadows declined from a high of 10% in May to less than 5% in September (Bailey et al. 1992).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
MINT *(Mentha arvensis)*	1	0-1	33
DOCK *(Rumex occidentalis)*	1	0-1	33
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	15	1-40	100
WATER SEDGE (*Carex aquatilis*)	1	0-1	33
AWNED SEDGE *(Carex atherodes)*	85	60-97	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC-SUBHYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1267(1221-1363) M

SOIL DRAINAGE:
IMPERFECTLY, POORLY

SLOPE:
1%

ASPECT:
VARIABLE

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	2000
FORB	150
TOTAL	2150

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.4 (0.3-0.5) HA /AUM OR
1 (1.3-0.8) AUM/AC

B13. Tufted hairgrass-Baltic rush

(Deschampsia cespitosa-Juncus baliticus

n=2 This community type is very similar to the tufted hairgrass-dominated communities described in the Upper foothills and Subalpine subregions of northern Alberta (Willoughby 2001) and may indicate the transition from the Montane to the Subalpine subregion in southern Alberta. This community is located on moist sites that are better drained and slightly drier than the pure sedge meadows. When this community is protected from grazing and fire for 25-40 years willow and bog birch expand and tufted hairgrass and sedge decline. The decline in graminoid cover causes a decline in available forage production.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	19	0-19	50
FORBS			
OLD MAN'S WHISKERS *(Geum triflorum)*	11	0-21	50
SMOOTH-LEAVED CINQUEFOIL *(Potentilla diversifolia)*	10	0-19	50
YELLOW BEARDSTONGUE *(Penstemon confertus)*	2	0-3	50
GRASSES			
TUFTED HAIRGRASS *(Deschampsia cespitosa)*	52	24-80	100
CREEPING WIRE RUSH *(Eleocharis palustris)*	10	0-20	50
BALTIC RUSH *(Juncus baliticus)*	15	3-26	100
THREE SQUARE RUSH *(Scirpus pungens)*	10	0-20	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1497(1485-1509) M

SOIL DRAINAGE:
POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	2238
FORB	239
SHRUB	170
TOTAL	2646

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1 (0.8-1.5) HA /AUM OR
0.4 (0.5-0.27) AUM/AC

B13a. Baltic rush

(Juncus balticus)

n=2 This community type is a grazing disclimax of the tufted hairgrass or sedge dominated communities (Thompson and Hansen 2002). Baltic rush is generally unpalatable to livestock and will increase with an increase in grazing pressure. The presence of this community type would indicate livestock distribution problems on the disposition and some type of rest rotational grazing system is needed to allow this community type to recover.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
WATER SMARTWEED *(Polygonum amphibium)*	2	0-3	50
GRACEFUL CINQUEFOIL (*Potentilla gracilis*)	2	0-3	50
SMOOTH ASTER (*Aster laevis*)	2	0-3	50
GRASSES			
TUFTED HAIRGRASS *(Deschampsia cespitosa)*	2	0-3	50
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	1-2	100
BALTIC RUSH *(Juncus baliticus)*	63	28-98	100
KENTUCKY BLUEGRASS (Poa *pratensis*)	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC-HYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1341(1221-1460) M

SOIL DRAINAGE:
POORLY-IMPERFECTLY

ECOLOGICAL STATUS SCORE: 8-16

FORAGE PRODUCTION (KG/HA)

TOTAL 1250*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
0.8 HA/AUM OR
0.5 AUM/AC

B14. Forb meadows

(Aster ciliolatus, Monarda fistulosa, Smilacina stellata)

n=2 This community type represents small isolated forest openings that are dominated by forbs. The sites tend to be moist, moderately well drained and probably have some nutrient seepage at some time in the year. These meadows can be dominated by Lindley's aster, wild bergamont, or star flowered solomon's seal. The grass layer is generally poorly developed which makes this community type hard to group with any of the grassland community types.

The forage production of this community type is generally quite high because of the higher moisture and nutrient content of the soil, but the areas are so small and isolated they contribute little to the overall carrying capacity of a disposition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
STRAWBERRY *(Fragaria virginiana)*	5	1-8	100
STAR FLOWERED SOLOMON'S SEAL *(Smilacina stellata)*	6	0-12	50
WILD BERGAMONT *(Monarda fistulosa)*	15	0-30	50
LINDLEY'S ASTER *(Aster ciliolatus)*	15	0-29	50
YELLOW PEAVINE *(Lathyrus ochroleucus)*	3	0-6	50
YELLOW COLUMBINE *(Aquilegia flavescens)*	4	0-8	50
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	5	0-10	50
IDAHO FESCUE *(Festuca idahoensis)*	6	5-6	100
PARRY OATGRASS *(Danthonia parryi)*	5	0-9	50
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1565(1450-1680)M

SOIL DRAINAGE:
WELL

SLOPE:
22(2-40)%

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	824
FORB	146
SHRUB	292
TOTAL	1262

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.7 (0.6-0.7) HA/AUM OR
0.55 (0.65-0.4) AUM/AC

B15. Rough fescue-Hairy wildrye

(Festuca scabrella-Elymus innovatus)

n=2 This community type was described on the east slopes of the Livingstone range and appears to represent a transitional community from the lower Montane subregion to the higher Subalpine region. Indeed Willoughby(1999) described a Rough fescue-Hairy wildrye community type in the southern subalpine. They felt that as one moved upslope there would be a shift in codominance of sedge to hairy wildrye and an increase in cover of bearberry and juniper. Corns and Achuff (1982), described hairy wildrye dominated community types on south facing slopes in the more northern ecodistricts of the subalpine. They felt these grasslands occurred on areas with frequent snow avalanching. It is possible that this community type is associated with deeper snow accumulation than the other rough fescue dominated types.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	7	0-13	50
PRICKLY ROSE (*Rosa acicularis*)	2	1-2	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	5	2-7	100
OLD MAN'S WHISKERS *(Geum triflorum)*	6	0-11	50
YELLOW HEDYSARUM *(Hedysarum sulphurescens)*	4	0-8	50
MOUNTAIN SHOOTING STAR *(Dodecatheon conjugens)*	2	0-4	50
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	6	0-11	50
FIREWEED *(Epilobium angustifolium)*	5	0-9	50
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	19	18-20	100
IDAHO FESCUE *(Festuca idahoensis)*	4	1-6	100
PARRY OATGRASS *(Danthonia parryi)*	4	0-7	50
HAIRY WILDRYE *(Elymus innovatus)*	15	14-15	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1643(1606-1680) M

SOIL DRAINAGE:
WELL

SLOPE:
5(0-10)%

ASPECT:
EAST, LEVEL

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1996(1580-2412)
FORB	645(598-692)
SHRUB	96(44-148)
TOTAL	2737(222-3252)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.52 (0.5-0.65) HA /AUM OR
0.8 (0.8-0.64) AUM/AC

B16. Big sagebrush-Buckthorn/Kentucky bluegrass

(Artemisia tridentata-Rhamnus alnifolia/Poa pratensis)

n=2 This community type was described on the valley bottoms and meadows adjacent to the South Castle river. Buckthorn tends to grow in the moist areas of the meadows which have fine textured soils. In contrast big sagebrush is found on the drier, gravelly soils of old creek beds. These meadows have been extensively utilized by livestock and recreationists which has allowed Kentucky bluegrass, timothy and dandelion to become established in the understory of these shrub species. It is difficult to determine what the understory vegetation was prior to disturbance. It is felt that this site was probably dominated by rough fescue, but the presence of dark scaled sedge and graceful sedge appear to indicate a higher moisture regime than rough fescue-dominated communities. The establishment of an exclosure to protect the site from disturbance may help to answer this question.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
BIG SAGEBRUSH *(Artemisia tridentata)*	19	17-21	100
SNOWBERRY *(Symphoricarpos occidentalis)*	17	16-18	100
BUCKTHORN *(Rhamnus alnifolia)*	7	5-8	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	6	5-7	100
YELLOW BEARDSTONGUE *(Penstemon confertus)*	29	28-30	100
YARROW *(Achillea millefolium)*	8	7-9	100
STAR FLW'D SOLOMON'S SEAL *(Smilacina stellata)*	3	2-3	100
DANDELION *(Taraxacum officinale)*	3	3	100
HEART LV'D ALEXANDER *(Zizia aptera)*	1	0-1	50
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	25	14-36	100
TIMOTHY *(Phleum pratense)*	9	9	100
DARK SCALED SEDGE *(Carex atrosquama)*	1	0-1	50
GRACEFUL SEDGE *(Carex praegracilis)*	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1440 M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
1%

ASPECT:
WEST

ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

GRASS	268
FORB	745
SHRUB	141
TOTAL	1154

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.8 (0.6-1) HA/AUM OR
0.5 (0.66-0.4) AUM/AC

B17. Creeping spike rush

(Eleocharis palustris)

n=1 Thompson and Hansen (2002) described this type on somewhat alkaline sites in narrow bands along streams, rivers, lake margins and reservoirs. These sites are subject to yearly flooding. Typically these sites are almost pure stands of creeping spike rush. Creeping spike rush is generally unpalatable to livestock and the wet conditions limit livestock use. This community type should be rated as non-use.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
GRASSES			
CREEPING SPIKE RUSH *(Eleocharis palustris)*	98	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1375 M

SOIL DRAINAGE:
IMPERFECTLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

TOTAL 1200*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
0.8 HA/AUM OR
0.5 AUM/AC

B18. Small fruited bulrush

(Scripus microcarpus)

n=1 This community type is associated with wet areas along the edges of perennial streams, marshes and ponds. It has similar site conditions to the beaked and water sedge dominated meadows, where drainage is better than the Great bulrush and cattail dominated community types. The wet conditions and generally poor palatability of small fruited bulrush limits it use. This community should be rated as non-use.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
CURLED DOCK *(Rumex crispus)*	3	-	100
GRASSES			
TUFTED HAIRGRASS *(Deschampsia cespitosa)*	3	-	100
BEAKED SEDGE *(Carex rostrata)*	3	-	100
SMALL FRUITED BULRUSH *(Scirpus microcarpos)*	98	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1410 M

SOIL DRAINAGE:
IMPERFECTLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

TOTAL 1500*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
0.7 HA/AUM OR
0.57 AUM/AC

B19. Great bulrush

(Scirpus acutus)

n=2 This community type occurs along the margins of ponds and lakes (Thompson and Hansen 2002). Great bulrush tends to be found growing in the water. Often the water is up to 2 m deep. This community type is much wetter than the previously described small fruited bulrush community. The wet conditions and unpalatability of great bulrush limits the use of this community type. This community should be rated as non-use.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
FORBS			
WATER SMARTWEED *(Equisetum fluviatile)*	40	0-80	50
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	1	0-1	50
GREAT BULRUSH *(Scirpus acutus)*	74	50-97	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1291(1219-1363)M

SOIL DRAINAGE:
VERY POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

TOTAL	2200*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
0.5 HA/AUM OR
0.75 AUM/AC

B20. Cattail

(Typha latifolia)

n=2 This community type is associated with standing water. Thompson and Hansen (2002) have found that the saturated or inundated conditions tend to limit species diversity. The wet conditions limit use by domestic livestock and this community type should be rated as non-use.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
FORBS			
SWAMP HORSETAIL *(Equisetum fluviatile)*	2	0-3	50
CATTAIL *(Typha latifolia)*	94	90-97	100
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	5	0-10	50
GREAT BULRUSH *(Scirpus acutus)*	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1291(1219-1363) M

SOIL DRAINAGE:
VERY POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

TOTAL 2500*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
0.5 HA/AUM OR
0.75 AUM/AC

A7. Bearberry/Juniper

(Arctostaphylos uva-ursi/Juniperus spp.)

n=25 This community type represents the forest-grassland ecotone on dry, rocky, windswept, south facing slopes throughout the Banff and Jasper river valleys and higher elevation sites in the Blairmore and Morley Foothills of the Montane. Indeed many of the stands described in this community type were placed into douglas fir and spruce forest types described by Corns and Achuff (1982). Lane et al. (2000), described a similar community type Low northern sedge/Bearberry on rocky hilltops in the Lower Foothills subregion near Hinton.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	4	0-25	50
LODGEPOLE PINE *(Pinus contorta)*	2	0-11	44
SHRUBS			
JUNIPER *(Juniperus communis, J. horizontalis)*	9	3-35	100
BUFFALOBERRY *(Shepherdia canadensis)*	4	0-40	52
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	5	0-35	88
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	25	4-60	100
WHITE CAMAS *(Zigadenus elegans)*	2	0-20	28
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	0-10	12
GRASSES			
RUSH LIKE SEDGE *(Carex scirpoidea)*	2	0-20	16
HAIRY WILD RYE *(Elymus innovatus)*	3	0-15	76
JUNEGRASS *(Koeleria macrantha)*	2	0-3	44

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC TO SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1330(1000-1660) M

SOIL DRAINAGE:
WELL TO RAPIDLY

SLOPE:
28(0-68)%

ASPECT:
SOUTHERLY-WESTERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION KG/HA

TOTAL 500* *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 HA/AUM (0.2 AUM/AC)

MONTANE SUBREGION

BLAIRMORE AND MORLEY FOOTHILLS ECODISTRICTS

DISTURBED GRASSLAND COMMUNITY TYPES

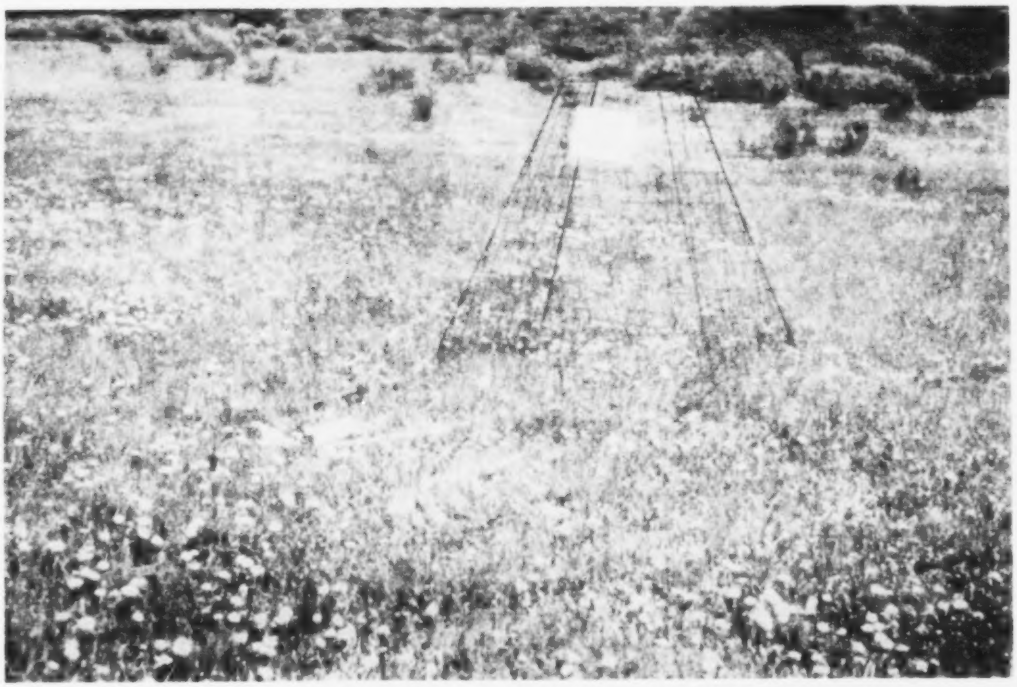

Photo 6: The dominance of Kentucky bluegrass, dandelion and clover indicate that this is an overgrazed grassland. Once Kentucky bluegrass has established dominance, the site will not return to the original vegetation composition when protected from grazing. Instead it will move to another community type, dominated by Kentucky bluegrass and native species such as rough fescue.

C1. Idaho fescue-Parry oatgrass-Sedge

(Festuca idahoensis-Danthonia parryi-Carex obtusata)

n=32 This community type represents a Rough fescue-Idaho fescue-Parry oatgrass plant community that has been moderately to heavily grazed for a number of years. The species composition of this community is very similar to the Idaho fescue-Parry oatgrass-Rough fescue community types , but this community type occupies lower slope positions, whereas the latter community occupies mid to upper slope positions.

Increased grazing pressure causes rough fescue to decline and allows Idaho fescue, Parry oatgrass and sedge species to increase. Continued heavy grazing pressure will eventually lead to a decline in all native species and Kentucky bluegrass and dandelion will dominate the site. If grazing pressure on this community type is reduced or is eliminated the type will likely succeed back to a rough fescue dominated grassland. However, if the present grazing pressure continues Kentucky bluegrass will likely dominate the site. Recovery of this grassland back to a rough fescue dominated community type will likely take 20-30 years (Willoughby 1996).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-12	41
FORBS			
THREE FLOWERED AVENS *(Geum triflorum)*	5	0-19	53
COMMON YARROW *(Achillea millefolium)*	3	0-9	93
DANDELION *(Taraxacum officinale)*	1	0-13	59
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1	0-9	63
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-9	84
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	5	0-14	88
IDAHO FESCUE *(Festuca idahoensis)*	16	1-77	100
PARRY OATGRASS *(Danthonia parryi)*	10	0-63	67
BLUNT SEDGE *(Carex obtusata)*	2	0-49	47
KENTUCKY BLUEGRASS *(Poa pratensis)*	6	0-24	75

ENVIRONMENTAL VARIABLE

MOISTURE REGIME:
SUBMESIC-MESIC
NUTRIENT REGIME
MESOTROPHIC TO PERMESOTROPHIC
ELEVATION:
1489 (1330-1920) M
SOIL DRAINAGE:
RAPIDLY TO WELL
SLOPE:
13(2-36)%
ASPECT:
SOUTH AND WEST

ECOLOGICAL STATUS SCORE: 16

FORAGE PRODUCTION (KG/HA)

GRASS	1157(582-2796)
FORB	508(0-1230)
SHRUB	10(0-78)
TOTAL	1674(836-3134)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.7 (0.62-0.81) HA/AUM OR
0.57 (0.65-0.5) AUM/AC

C1a. Sedge-Parry oatgrass-Idaho fescue

(Carex obtusata-Danthonia parryii-Festuca idahoensis)

n=38 This community type represents a Idaho fescue-Parry oatgrass-Rough fescue plant community that has been moderately to heavily grazed for a number of years.

Increased grazing pressure causes rough fescue to decline and allows Idaho fescue, Parry oatgrass and sedge species to increase. Continued heavy grazing pressure will eventually lead to a decline in sedge, Parry oatgrass and Idaho fescue and there will be an increase in cover of little clubmoss and moss phlox. If grazing pressure on this community type is reduced or is eliminated the type will likely succeed back to a Idaho fescue, Parry oatgrass dominated grassland. Recovery of this grassland back to a Parry oatgrass or Idaho fescue dominated community type will likely take 20-30 years (Willoughby 1996).

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
PRAIRIE ROSE *(Rosa arkansana)*	1	0-1	75
FORBS			
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	3	0-4	95
COMMON YARROW *(Achillea millefolium)*	1	0-2	50
DANDELION *(Taraxacum officinale)*	1	0-1	38
FRINGED SAGE *(Artemisia frigida)*	2	0-3	88
LITTLE CLUBMOSS *(Selaginella densa)*	2	0-7	50
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	9	1-41	100
IDAHO FESCUE *(Festuca idahoensis)*	1	0-1	50
PARRY OATGRASS *(Danthonia parryi)*	17	8-25	100
BLUNT SEDGE *(Carex obtusata)*	19	8-29	100
JUNEGRASS *(Koeleria macrantha)*	3	0-9	63

ENVIRONMENTAL VARIABLE

MOISTURE REGIME:
SUBMESIC-SUBXERIC

NUTRIENT REGIME
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1610 M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
16 %

ASPECT:
SOUTH AND WEST

ECOLOGICAL STATUS SCORE: 16

FORAGE PRODUCTION (KG/HA)

TOTAL 1000 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1 (0.8-2) HA/AUM OR
0.4 (0.5-0.2) AUM/AC

C2. Canada bluegrass-Rough fescue-Slender wheatgrass

(Poa compressa-Festuca scabrella-Agropyron trachycaulum)

n=14 This community type was described on mesic, lower slope positions with shallow, nutrient poor soils. The presence of blunt sedge, junegrass and plains reedgrass are all indicative of dry, nutrient poor sites. The dominance of Canada bluegrass an introduced, occasional species that is adapted to grow on waste ground also appears to indicate that this community type is typical of nutrient poor soils. This community type appears to have also been moderately grazed. Increased grazing pressure causes rough fescue to decline and allows Canada bluegrass and dandelion to increase.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-20	57
FORBS			
OLD MAN'S WHISKERS *(Geum triflorum)*	3	0-7	79
COMMON YARROW *(Achillea millefolium)*	7	1-15	100
DANDELION *(Taraxacum officinale)*	8	0-24	86
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	3	0-13	79
NORTHERN BEDSTRAW *(Galium boreale)*	4	0-12	92
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	7	0-26	79
IDAHO FESCUE *(Festuca idahoensis)*	8	0-44	71
PARRY OATGRASS *(Danthonia parryi)*	3	0-13	36
BLUNT SEDGE *(Carex obtusata)*	6	0-19	62
CANADA BLUEGRASS *(Poa compressa)*	20	0-51	79

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC-SUBHYGRIC

NUTRIENT REGIME
MESOTROPHIC

ELEVATION:
1476(1320-1631) M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
14(0-30)%

ASPECT:
SOUTHERLY

ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

GRASS	1455(5-3042)
FORB	542(0-878)
SHRUB	9(0-44)
TOTAL	1637(5-3692)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.52 (0.5-0.85) HA/AUM OR
0.8 (0.8-0.47) AUM/AC

C3. Kentucky bluegrass-Rough fescue

(Poa pratensis-Festuca scabrella)

n=70 Long-term heavy grazing pressure leads to decline in rough fescue and an increase in Parry oatgrass and sedge species. Continued grazing pressure reduces the competitive advantage of rough fescue and the other native grass species and allows Kentucky bluegrass to establish on the site. Continued heavy grazing pressure eventually leads to a decline in all native species and the plant community will resemble a Timothy-Kentucky bluegrass/ Dandelion type.

The shallow, nutrient poor soils of the Canada bluegrass dominated community type do not appear to favour the growth of Kentucky bluegrass under similar grazing conditions and may explain the lack of Kentucky bluegrass in the Canada bluegrass-Rough fescue-Slender wheatgrass community type..

The forage productivity of this community type (2600 kg/ha) is equivalent to or better than a lightly grazed Rough fescue-Parry oatgrass community (2015 kg/ha). However, rough fescue is a much more desirable forage species because it maintains its nutrient content into the dormant season. In contrast, Kentucky bluegrass loses its palatability, and nutrient content if it is allowed to flower and set seed.

Plant Composition

	Canopy Cover(%)		
	Mean	**Range**	**Const.**
Shrubs			
Shrubby cinquefoil *(Potentilla fruticosa)*	2	0-11	50
Forbs			
Yarrow *(Achillea millefolium)*	5	0-41	93
Old Man's whiskers *(Geum triflorum)*	5	0-41	61
Dandelion *(Taraxacum officinale)*	5	0-42	81
Graceful cinquefoil (*Potentilla gracilis*)	2	0-13	63
Grasses			
Parry oatgrass *(Danthonia parryi)*	3	0-21	60
Rough fescue *(Festuca scabrella)*	7	0-30	77
Idaho fescue (*Festuca idahoensis*)	6	0-39	78
Blunt sedge (*Carex obtusata*)	3	0-18	44
Kentucky bluegrass (*Poa pratensis*)	27	0-80	96
Timothy (*Phleum pratense*)	6	0-31	63

Environmental Variables

Moisture Regime:
Submesic to mesic
Nutrient Regime:
mesotrophic to Permesotrophic
Elevation:
1487(1300-1768) m
Soil Drainage:
Well to Moderately well
Slope:
16(5-55)%
Aspect:
Southerly

Ecological Status score: 8

Forage Production (kg/ha)

Grass	1749(118-5028)
Forb	587(0-1720)
Shrub	47(0-270)
Total	2365(566-5886)

Ecologically sustainable stocking rate
0.52 (0.5-0.85) ha/AUM or
0.8 (0.8-0.47) AUM/ac

C4. Kentucky bluegrass-Timothy/Dandelion

(Poa pratensis-Phleum pratense/Taraxacum officinale)

n=80 This community type appears to once have represented a Rough fescue-Parry oatgrass-Idaho fescue community type on Black Chernozmic soils. Conitunued heavy grazing at the beginning of the century has shifted the community to one dominated by Kentucky bluegrass, timothy and dandelion.

The climax range condition model suggests that vegetation development will be directional, predictable and revert to the original vegetation when protected from grazing, but once Kentucky bluegrass has established, bluegrass appears to compete with rough fescue for codominance. When protected from grazing these Kentucky bluegrass dominated types move toward a different community type rather than back to the original vegetation. These sites closely follow the "State transition model" proposed by Westoby et al. (1989).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY			
(Symphoricarpos occidentalis)	1	0-18	10
FORBS			
GRACEFUL CINQUEFOIL			
(Potentilla gracilis)	3	0-45	65
DANDELION			
(Taraxacum officinale)	11	0-51	91
COMMON YARROW			
(Achillea millefolium)	6	0-45	94
MOUSE EARED CHICKWEED			
(Cerastium arvense)	1	0-22	53
STICKY PURPLE GERANIUM			
(Geranium viscosissimum)	2	0-15	49
GRASSES			
KENTUCKY BLUEGRASS			
(Poa pratensis)	33	0-92	98
TIMOTHY			
(Phleum pratense)	24	0-90	93
ROUGH FESCUE			
(Festuca scabrella)	1	0-12	25
IDAHO FESCUE			
(Festuca idahoensis)	1	0-23	25
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	1	0-17	44

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBMESIC

NUTRIENT REGIME:
PERMESOTROPHIC-MESOTROPHIC

ELEVATION:
1484(1350-1682) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
8(0-36)%

ASPECT:
SOUTH TO WESTERLY

ECOLOGICAL STATUS SCORE: 0 OR MODIFIED

FORAGE PRODUCTION (KG/HA)

GRASS	1696(244-3308)
FORB	701(0-4790)
SHRUB	51(0-640)
TOTAL	2475(284-5242)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.52 (0.5-0.85) HA/AUM OR
0.8 (0.8-0.47) AUM/AC

C5. Smooth brome-Kentucky bluegrass

(Bromus inermis-Poa pratensis)

n=14 These sites probably were once rough fescue dominated. Cultivation and extreme grazing pressure have led to a decline in all native species. If these sites had been left undisturbed they would probably resemble a Rough fescue-Parry oatgrass-Idaho fescue community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
CANADA THISTLE			
(Cirsium arvense)	3	0-14	57
COMMON YARROW			
(Achillea millefolium)	2	0-5	79
STRAWBERRY			
(Fragaria virginiana)	3	0-23	36
GRASSES			
KENTUCKY BLUEGRASS			
(Poa pratensis)	36	0-87	86
SMOOTH BROME			
(Bromus inermis)	40	2-78	100
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	1	0-9	50
TIMOTHY			
(Phleum pratense)	4	0-23	71

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1445(1300-1768) M

SOIL DRAINAGE :
WELL

SLOPE:
8(0-60)%

ASPECT:
SOUTH TO WEST

ECOLOGICAL STATUS SCORE: 0 OR MODIFIED

FORAGE PRODUCTION (KG/HA)

GRASS	1761(900-3204)
FORB	260(44-528)
SHRUB	26(0-150)
TOTAL	1822(1300-3204)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.52 (0.5-0.85) HA/AUM OR
0.8 (0.8-0.47) AUM/AC

C6. Sedge/Little clubmoss-Moss phlox

(Carex obtusata/Selaginella densa-Phlox hoodii)

n=5 On dry, gravelly sites within the Parry oatgrass-Rough fescue and Bluebunch wheatgrass dominated community types increased grazing pressure causes Parry oatgrass, rough fescue and bluebunch wheatgrass to decline and allows low growing sedge and forb species to increase to form this community type. Indeed one of the sites (Stoddo) represents the outside transect of a rangeland reference area (Willoughby 1992). The inside transect which has been protected from grazing pressure belongs to the Idaho fescue-Parry oatgrass-Rough fescue community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL (*Potentilla fruticosa*)	1	0-3	80
FORBS			
LITTLE CLUBMOSS *(Selaginella densa)*	24	0-42	80
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	3	0-12	60
NODDING ONION *(Allium cernuum)*	1	0-1	40
MOSS PHLOX *(Phlox hoodii)*	13	5-20	100
FRINGED SAGE *(Artemisia frigida)*	3	1-4	100
GRASSES			
BLUNT SEDGE *(Carex obtusata)*	12	7-20	100
JUNEGRASS *(Koeleria macrantha)*	7	2-13	100
ROUGH FESCUE *(Festuca scabrella)*	4	1-5	100
PARRY OATGRASS *(Danthonia parryi)*	11	0-17	80
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	4	0-14	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
SUBMESOTROPHIC TO MESIC

ELEVATION(RANGE):
1631 (1424-1787) M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE (RANGE):
12(0-26)%

ASPECT:
SOUTHWEST

ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

GRASS	460(194-732)
FORB	355(182-742)
SHRUB	67(0-167)
TOTAL	881(476-1474)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (0.8-2) HA/AUM OR
0.27 (0.5-0.2) AUM/AC

C6a. Little clubmoss/Sedge

(Selaginella densa/Sedge)

n=8 On dry, gravelly sites within the Parry oatgrass-Rough fescue and Bluebunch wheatgrass dominated community types increased grazing pressure causes Parry oatgrass, rough fescue and bluebunch wheatgrass to decline and allows low growing sedge and forb species to increase to form this community type. This community type generally forms when the previously described community (Sedge/Little clubmoss-Moss phlox)community is continuously grazed. There is very little grass or forb cover found within this community type. If protected from grazing this community will eventually recover to form a Parry oatgrass or Idaho fescue dominated community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
PRAIRIE ROSE (*Rosa arkansana*)	1	0-1	83
FORBS			
LITTLE CLUBMOSS *(Selaginella densa)*	37	20-57	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	0-5	63
GOLDEN ASTER *(Heterotheca villosa)*	3	0-10	38
MOSS PHLOX *(Phlox hoodii)*	1	0-1	25
FRINGED SAGE *(Artemisia frigida)*	2	0-5	50
GRASSES			
BLUNT SEDGE *(Carex obtusata)*	9	0-32	88
JUNEGRASS *(Koeleria macrantha)*	1	0-3	75
ROUGH FESCUE *(Festuca scabrella)*	1	0-4	75
PARRY OATGRASS *(Danthonia parryi)*	4	0-10	50
IDAHO FESCUE *(Festuca idahoensis)*	4	0-18	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC-SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION(RANGE):
1490(1370-1610) M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE (RANGE):
12(5-19)%

ASPECT:
SOUTHWEST

ECOLOGICAL STATUS SCORE: 0

FORAGE PRODUCTION (KG/HA)

TOTAL 700 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (0.8-2.5) HA/AUM OR
0.23 (0.5-0.16) AUM/AC

C7. Creeping red fescue/Dandelion-Clover

(Festuca rubra/Taraxacum offincinale-Trifolium repens)

n=10 This community is an example of a rough fescue grassland which has been modified during reclamation of a natural gas pipeline and power transmission lines. Seed from the reclamation has influenced the plant association such that creeping red fescue and Kentucky bluegrass now dominate the site. Previously tame species like creeping red fescue were used in reclamation with little thought given to compatibility with surrounding native vegetation. It is now recognized that native species that promote the recovery of the original community structure and function should be used in reclamation (Gerling et al. 1996).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
DANDELION *(Taraxacum officinale)*	4	0-18	90
WHITE DUTCH CLOVER *(Trifolium repens)*	9	0-49	50
SWEET CLOVER *(Melilotus alba)*	1	0-11	10
ALFALFA *(Medicago sativa)*	3	0-26	10
COMMON YARROW *(Achillea millefolium)*	1	0-5	70
STRAWBERRY *(Fragaria virginiana)*	30	15	70
GRASSES			
TIMOTHY *(Phleum pratense)*	7	1-19	100
CREEPING RED FESCUE *(Festuca rubra)*	52	22-83	100
BLUNT SEDGE *(Carex obtusata)*	1	0-7	10
KENTUCKY BLUE GRASS *(Poa pratensis)*	8	0-27	90

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION(RANGE):
1503(1380-1615)M

SOIL DRAINAGE:
RAPIDLY TO MODERATELY WELL

SLOPE (RANGE):
8(4-10)%

ASPECT:
SOUTH

ECOLOGICAL STATUS SCORE: MODIFIED

FORAGE PRODUCTION (KG/HA)

GRASS	1833(968-2600)
FORB	601(54-1044)
TOTAL	2434(2012-2654)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.52 (0.5-0.85) HA/AUM OR
0.8 (0.8-0.47) AUM/AC

C8. Northern wheatgrass-Kentucky bluegrass

(Agropyron dasystachyum-Poa pratensis)

n=1 This community type is found on a dry, moderately to heavily grazed, south-facing slopes with shallow soils above the Oldman river in the Outer Gap range allotment. The moisture regime is not high enough to allow complete invasion of Kentucky bluegrass and dandelion . In the absence of disturbance the community type would probably resemble moister sites within the Bluebunch wheatgrass-Sedge community type.

The Outer Gap allotment is subject to extremely high, dessicating winds. As a result, the climate is very similar to the grasslands described in Rocky Foothills and Rocky Mountain ecodistricts. Indeed many of the species characteristic of the grasslands described in these ecodistricts (junegrass, northern wheatgrass, blunt sedge, small leaved everlasting) are found in this community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY			
(Symphoricarpos occidentalis)	12	-	100
PRAIRIE ROSE			
(Rosa arkansana)	7	-	100
FORBS			
DANDELION			
(Taraxacum officinale)	14	-	100
AMERICAN VETCH			
(Vicia americana)	13	-	100
SMALL LEAVED EVERLASTING			
(Antennaria parviflora)	10	-	100
SHOWY LOCOWEED			
(Oxytropis splendens)	8	-	100
LOW GOLDENROD			
(Solidago missouriensis)	6	-	100
GRASSES			
NORTHERN WHEATGRASS			
(Agropyron dasystachyum)	35	-	100
KENTUCKY BLUEGRASS			
(Poa pratensis)	16	-	100
BLUNT SEDGE			
(Carex obtusata)	10	-	100
CANBY BLUEGRASS			
(Poa canbyi)	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1545 M

SOIL DRAINAGE:
WELL

SLOPE:
15%

ASPECT:
SOUTHERLY

ECOLOGICAL STATUS SCORE: 8-16

FORAGE PRODUCTION KG/HA

GRASS	1112
FORB	642
SHRUB	82
TOTAL	1836

ECOLOGICALLY SUSTAINABLE STOCKING RATE
3 (2-4.3) HA/AUM OR
0.14 (0.2-0.1) AUM/AC

C9. Rough fescue-Kentucky bluegrass

(Festuca scabrella-Poa pratensis)

n=28 This community type represents grasslands that have been grazed heavily to the point of Kentucky bluegrass invasion and are now recovering, or ungrazed exclosures that have been invaded by Kentucky bluegrass. Long-term heavy grazing pressure leads to a decline in rough fescue and an increase in Parry oatgrass and sedge species. Continued grazing pressure reduces the competitive advantage of rough fescue and the other native grass species and allows Kentucky bluegrass to establish on the site. Protection or a reduction in stocking level at the point where Kentucky bluegrass has become a significant component of the community allows rough fescue to recover, but it seems Kentucky bluegrass also remains as codominant. Willoughby (1996), found that some rangeland reference area sites which were protected from grazing before Kentucky bluegrass became established recovered to Rough fescue-Idaho fescue-Parry oatgrass in 20-30 years. In contrast sites that had significant Kentucky bluegrass invasion recovered to Rough fescue-Kentucky bluegrass dominated sites over the same time period. It appears that both the unidirectional climax range condition model proposed by Dysterhuis (Wroe et al. 1988) and the State and Threshold model proposed by Westoby et al. (1989) apply to the successional sequences of the rough fescue grasslands of southwestern Alberta. This makes it extremely difficult to assess range health on these sites (Willoughby and Alexander 2000). That is why the Ecological site and Desired Plant community concepts proposed by the Task Group on Unity in Concepts and Terminology (1995) have been adopted to determine range health on these rangelands.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-33	61
FORBS			
YARROW *(Achillea millefolium)*	4	0-16	89
OLD MAN'S WHISKERS *(Geum triflorum)*	8	0-30	75
DANDELION *(Taraxacum officinale)*	1	0-5	61
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1	0-6	50
AMERICAN VETCH *(Vicia american)*	1	0-6	57
GRASSES			
PARRY OATGRASS *(Danthonia parryi)*	4	0-15	82
ROUGH FESCUE *(Festuca scabrella)*	22	9-44	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	11	0-41	89
TIMOTHY *(Phleum pratense)*	3	0-20	43

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
ELEVATION(RANGE):
1507 (1330-1660) M
SOIL DRAINAGE:
WELL TO MODERATELY WELL
SLOPE (RANGE):
10(0-32)%
ASPECT:
SOUTHERLY
ECOLOGICAL STATUS SCORE: 24-16

FORAGE PRODUCTION (KG/HA)

GRASS	1135(398-2246)
FORB	449(20-1116)
SHRUB	28(0-150)
TOTAL	1611(456-2742)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.52 (0.5-0.65) HA/AUM OR
0.8 (0.8-0.63) AUM/AC

C10. Rough fescue-Sedge- Mountain brome

(Festuca scabrella-Carex obtusata-Bromus carinatus)

n=2 This community type represents grasslands that have been grazed moderately. Bromus carinatus is an introduced species that is well adapated to moist woods and dry open meadows. The two sites where this community were described were on lower slope positions.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
YARROW *(Achillea millefolium)*	1	1	100
OLD MAN'S WHISKERS *(Geum triflorum)*	3	1-5	100
DANDELION *(Taraxacum officinale)*	1	0-1	50
YELLOW BEARDSTONGUE *(Penstemon confertus)*	5	0-10	50
ALPINE BISTORT *(Polygonum viviparum)*	4	0-7	50
AMERICAN VETCH *(Vicia americana)*	3	0-6	50
GRASSES			
PARRY OATGRASS *(Danthonia parryi)*	1	0-1	50
ROUGH FESCUE *(Festuca scabrella)*	18	14-21	100
MOUNTAIN BROME *(Bromus carinatus)*	23	3-43	100
IDAHO FESCUE *(Festuca idahoensis)*	5	3-5	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
MESIC TO SUBMESIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION(RANGE):
1540(1494-1585) M

SOIL DRAINAGE:
WELL TO RAPIDLY

SLOPE:
45%

ASPECT:
SOUTHEASTERLY

ECOLOGICAL STATUS SCORE: 16

FORAGE PRODCUCTION (KG/HA)

GRASS	2185 (1170-3200)
FORB	136(60-212)
TOTAL	2321(1230-3412)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.52 (0.5-0.65) HA/AUM OR
0.8 (0.8-0.63) AUM/AC

C11. Snowberry/Kentucky bluegrass

(Symphoricarpus occidentalis/Poa pratensis)

n=3 This community type was described on lower slope positions along the valley bottoms of the Porcupine Hills. The increased moisture content on these sites favours the growth of snowberry which has slowly invaded into the surrounding grasslands. Snowberry is common in the understory of many aspen communities throughout the Montane subregion. It is likely this community type will eventually become dominated by aspen.

The high moisture and nutrient content of the site make this a very productive community type, but the high snowberry cover limits its use by livestock. Snowberry is very resistant to fire and sprouts readily after burning. It has been found that mowing followed by herbicide treatment is effective in controlling snowberry growth.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis,albus)*	54	51-70	100
FORBS			
DANDELION *(Taraxacum officinale)*	2	0-3	67
YARROW *(Achillea millefolium)*	1	1-3	100
AMERICAN VETCH *(Vicia americana)*	1	1-2	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	35	10-35	100
QUACKGRASS *(Agropyron repens)*	4	0-10	67
TIMOTHY *(Phleum pratense)*	2	0-3	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
MESIC TO SUBHYGIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION:
1365(1350-1372)M
SOIL DRAINAGE:
WELL
SLOPE:
10%
ASPECT:
SOUTHERLY
ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

GRASS	1184
FORB	0
SHRUB	2464
TOTAL	3648

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.1 (1-2.5) HA/AUM OR
0.35 (0.35-0.13) AUM/AC
(BASED ONLY ON GRASS PRODUCTION)

C12. Aspen/Orchardgrass-Kentucky bluegrass

(Populus tremuloided/Dactylis glomerata-Poa pratensis)

n=2 This community dominated by a regenerating aspen overstory and an understory of orchardgrass and Kentucky bluegrass represents old range improvement areas in the East Trout allotment in the Porcupine Hills. A number of treatments such as dragging and herbicide have been used to control aspen regeneration on these sites in the Porcupine Hills. These range improvement techniques should be considered for controlling aspen regeneration on this community type.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	14	0-28	50
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	1	0-2	50
ROSE (*Rosa acicularis*)	4	0-7	50
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	11	1-21	100
STRAWBERRY *(Fragaria virginiana)*	5	1-9	100
AMERICAN VETCH *(Vicia americana)*	1	1-2	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	12	9-14	100
ORCHARDGRASS *(Dactylis glomerata)*	25	11-37	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1525(1495-1555)M

SOIL DRAINAGE:
WELL

SLOPE:
12(10-15%)

ASPECT:
SOUTHERLY

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION (KG/HA)

GRASS	803
FORB	466
SHRUB	53
TOTAL	1322

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.7 (0.4-0.85) HA/AUM OR
0.57 (1-0.47) AUM/AC

C13. Sedge-Junegrass-Bluebunch wheatgrass

(Carex obtusata-Koeleria macrantha-Agropyron spicatum)

n=28 this community type represents a grazing disclimax of the Bluebunch wheatgrass dominated community found on steep south facing slopes in the Montane. As grazing pressure increases bluebunch wheatgrass cover will decline and sedge and junegrass will dominate the site. If grazing pressure continues to increase it is believed these sites will eventually become dominated by fringed sage and little clubmoss (Bailey et al 1992), but this community type has not yet been described in Alberta.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
PRAIRIE ROSE			
(Rosa arkansana)	1	0-2	88
WESTERN SNOWBERRY			
(Symphoricarpos occidentalis)	2	1-3	100
FORBS			
GRACEFUL CINQUEFOIL			
(Potentilla gracilis)	1	0-1	63
SMALL LEAVED EVERLASTING			
(Antennaria parviflora)	2	0-8	50
CUT LEAVED ANEMONE			
(Anemone multifida)	1	0-1	50
FRINGED SAGE			
(Artemisia frigida)	4	1-9	100
GRASSES			
JUNEGRASS			
(Koeleria macrantha)	7	2-10	100
RICHARDSONS NEEDLEGRASS			
(Stipa richarsonii)	1	0-2	75
BLUNT SEDGE			
(Carex obtusata)	8	3-12	100
BLUEBUNCH WHEATGRASS			
(Agropyron spicatum)	5	1-7	100
ROUGH FESCUE			
(Festuca scabrella)	2	0-5	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC-SUBMESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1580 M

SOIL DRAINAGE:
RAPIDLY TO VERY RAPIDLY

SLOPE:
46(0-65)%

ASPECT:
SOUTH TO WESTERLY

ECOLOGICAL STATUS SCORE: 16

FORAGE PRODUCTION(KG\HA)

TOTAL 900 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.5 (0.75-3.5 HA/AUM OR
0.17 (0.55-0.12) AUM/AC

MONTANE SHRUBLAND ECOLOGY

Shrubland communities in the montane subregion of Alberta occur in valley bottoms, depressional areas, and on moist upland seepage areas. They are highly diverse and dynamic communities that represent transition from wetland to forest or seral stages of development following disturbance. The Green alder-Scouler's willow-Wild red raspberry, Bebb willow/Hairy wild rye and Hawthorn-Snowberry/K. bluegrass community types are found on moist, upland sites. They represent seral stages of development following disturbance. The Green alder-Scouler's willow-Wild red raspberry community type is found on moderate northerly slopes and the Beaked willow/Hairy wild rye community type is found on south-facing slopes with high moisture and nutrient regimes. The Hawthorn-Snowberry dominated community is often associated with small drainages and seepage areas. These upland shrublands provide excellent forage for wildlife in the early stages of succession.

Lowland shrublands are found in low, marshy or bog sites and are often considered the edaphic climax communities on these sites since the wet cool soil conditions often prevent succession to forest. However, where organic matter begins to accumulate and the site becomes drier, succession to either black spruce or white spruce will occur. The extent of the shrub cover is highly dependent on the water level. Colonization by willow and other shrubs such as dwarf and bog birch begins on the drier edges of sedge meadows and streams. This colonization expands if the water level decreases, but declines under prolonged exposure to flooded conditions. The understory species most often associated with these shrublands include wire rush, beaked sedge, water sedge, other wetland sedges, and horsetail on the wettest sites. Bluejoint, slender wheatgrass, shrubby cinquefoil, and upland sedges are found on the more mesic, better drained sites. The better drained sites often have a Bebb willow overstory. Where water sedge and/or golden moss are dominant in the understory of the Sw/Willow/Water sedge/Golden moss community, indicates a calcium-rich environment, often with stagnant water (Beckingham, 1994; MacKinnon et. al., 1992). A dominance of beaked sedge in the understory of the Basket, Flat leaved or Bebb willow dominated communities, indicates nitrogen-rich conditions with flowing water (Beckingham, 1994). Bluejoint can also be a common understory species on the better-drained sites in these community types. It appears that tufted hair grass will replace bluejoint on similar sites as elevation increases (Lane et. al., 2000).

The shrublands found adjacent to riparian areas occur on well-drained, coarse-textured soils. River alder indicates a seepage area when found on a slope as in the Yellow mountain avens-River alder/Low forb community type. Elsewhere, it grows best on poorly-drained, lower slope positions. Yellow mountain avens is a common pioneer species on gravelly river bars and rocky slopes and grows especially well on calcium-rich soils (MacKinnon et. al., 1992). Silverberry and Drummond's willow are also common in these riparian areas. Both these species prefer well-drained, coarse-textured soils. The riparian shrublands described here will eventually succeed to white spruce in the absence of disturbance.

Increased grazing pressure tends to allow Kentucky bluegrass and timothy to invade the understory of many of these shrub dominated communities. The high moisture and nutrient content of these sites makes them very productive for livestock grazing.

Table 3. Shrubland community types of the Montane subregion.

Community	Community type	Productivity (kg/ha) (*estimated)				Moisture	Drainage	Carrying Capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
D1.	Yellow mountain avens-River alder/ Low forb	0*	10*	200*	210*	Submesic	Well	8.5
D2.	Yellow mountain avens/ June grass	200*	10*	50*	260*	Mesic	Very Rapidly	8.5
D2a.	Drummond's willow	100*	100*	500*	700*	Subhygric	Well	2.6
D3.	Bebb willow/Hairy wild rye	1000*	200*	200*	1400*	Subhygric	Mod. Well	1.3
D3a	Bebb willow/Marsh reedgrass	1000*	200*	200*	1400*	Subhydric	Mod. Well	1.2
D4.	Bebb willow/Kentucky bluegrass	750*	250*	500*	1500*	Subhygric	Imperfectly	1.2
D5.	Green alder-Scouler's willow-Wild red raspberry	0*	10*	150*	160*	Mesic	Well	10.0
D6.	Flat-leaved willow/Quackgrass-Kentucky bluegrass	2000*	200*	300*	2500*	Subhygric	Mod. Well	0.7
D7.	Flat lv'd willow/Horsetail/Sedge	0*	300*	200*	500*	Hygric	Imperfectly	3.6
D8.	Myrtle lv'd willow/Sedge	714	485	301	1500	Subhydric	Very Poorly	1.2
D9.	Basket willow/Sedge	1270	372	0	1642	Hygric	Mod. Well	1.1
D9a	Basket willow/Kentucky bluegrass	1270*	372*		1642*	Hygric	Mod. Well	1.2
D10.	Dwarf birch-Shrubby cinquefoil/ Northern valerian/Sedge	1500*	200*	300*	2000*	Hygric	Imperfectly	0.9
D11.	White spruce-Willow/Water sedge/ Golden moss	750*	100*	400*	1250*	Subhydric	Very Poorly	1.5
D12.	Black spruce/Myrtle-leaved willow/ Wire rush-Sedge/Moss	350*	50*	500*	900*	Subhydric	Poorly	2.0
D13.	Water birch-Smooth willow/Pinegrass				1800*	Hygric	Imperfectly	1.2
D14	Hawthorn-Snowberry/Kentucky bluegrass				1154*	Subhygric	Well	0.8

Montane shrublands key

1. Upland shrublands.......... **2**

Lowland or Riparian shrublands.......... **5**

2. Site is found at high elevations in upland depressions. Protection from the prevailing winds, and high moisture and nutrient regimes lead to a shrub dominated community. Trees may develop on the drier edges. Water birch is dominant..........**Water birch-Smooth willow/Pinegrass** d13

Green alder, Bebb willow or Hawthorn dominated.......... **3**

3. Site is a seepage area on moderate northerly slopes found on mesic to hygric lower subalpine sites..........**Green alder-Scouler's Willow-Wild red raspberry** d5

Bebb willow or Hawthorn dominated.......... **4**

4. Site is altered by grazing as indicated by the presence of Timothy and Nettle and is found close to Aspen forests..........**Bebb Willow/Kentucky bluegrass** d4

Drier upland shrub type found on ravines and seepage areas. Sited dominated by Bebb willow or Hawthorn..........**4a**

4a Hawthorn, snowberry dominated site.......... **Hawthorn-Snowberry/K. bluegrass d14**

Bebb willow, hairy wildrye dominated site.......... **Bebb willow/Hairy wildrye d3**

5. Lowland, depressional areas.......... **6**

Riparian areas adjacent to streams and rivers.......... **11**

6. Site undergoing succession to conifer forest, Sw, Sb present.......... **7**

Wet sites dominated by willow or dwarf birch, maybe grazed.......... **8**

7. Boggy sites with black spruce(Sb) ....**Sb/Myrtle lv'd willow/wire rush-Sedge/Moss d12**

Drier sites with white spruce (Sw).......... **Sw/Willow/Sedge/Golden moss d11**

8. Drier sites dominated by dwarf birch...... **Dwarf birch-Shrubby cinquefoil/Northern valerian/Sedge d10**

Wet sites willow dominated, also include grazed willow sites.......... **9**

9. Myrtle leaved willow dominated sites..........**Myrtle leaved willow/Sedge d8**

Sites dominated by Flat leaved, Basket or Bebb willow.......... **10**

10. Flat leaved willow dominated sites.......... **10a**

Bebb willow or Basket willow dominated sites.......... **10b**

10a Grazed site with Kentucky bluegrass or Quackgrass dominated understory ....**Flat lv'd willow/K. bluegrass d6**

Ungrazed site with sedge dominated understory..........**Flat lv'd willow/Sedge d7**

10b.Bebb willow dominated.......... **10c**

Basket willow dominated.......... **10d**

10c Grazed Bebb willow type, K. bluegrass in understory.......... **Bebb willow/Kentucky bluegrass d4**

Ungrazed Bebb willow type, sedge dominated understory.......... **Bebb willow/Marsh reedgrass d3a**

10d Ungrazed Basket willow site, with sedge dominated understory.......... **Basket willow/Sedge d9**

Grazed Basket willow site, K. bluegrass dominated understory..... **Basket willow/Kentucky bluegrass d9a**

11. Willow shrubland adjacent to rivers and streams on coarse textured soils.... **Drummond's willow d2a**

Yellow mountain avens dominated gravelly river flats.......... **12**

12. Site is on a moist, open south facing slope with a few Balsam poplar trees. Site is found up slope from the d2 community type. River alder is abundant..........**Yellow mountain avens-River alder/Low forb** d1

Site is dry gravelly river flats with nutrient poor soils. Junegrass is abundant.......... ....**Yellow mountain avens/Junegrass** d2

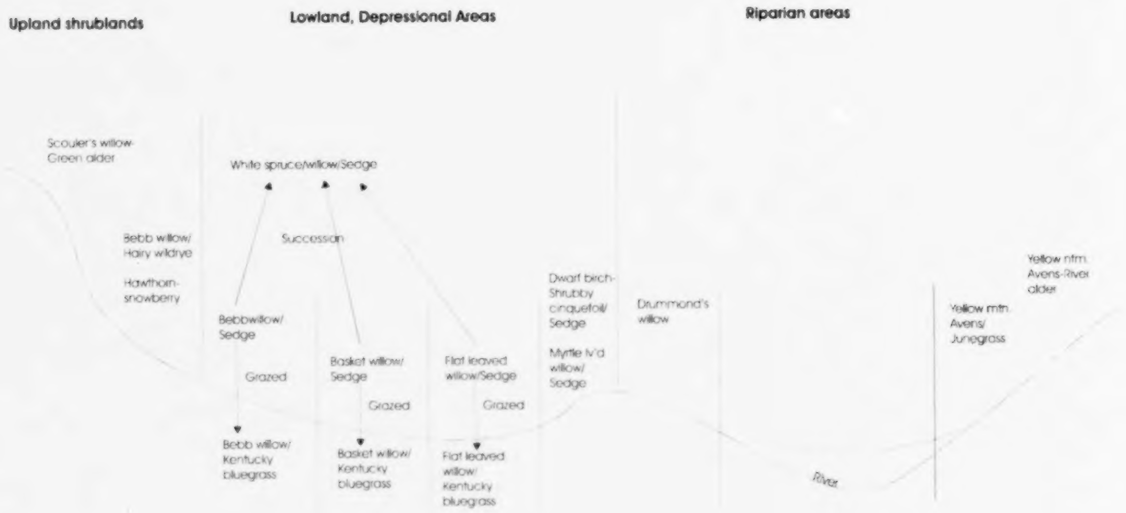
Upland shrublands
Lowland, Depressional Areas
Riparian areas
Scouler's willow-Green alder
White spruce/willow/Sedge
Bebb willow/Hairy wildrye
Hawthorn-snowberry
Succession
Dwarf birch-Shrubby cinquefoil/Sedge
Drummond's willow
Yellow mtn. Avens-River alder
Yellow mtn. Avens/Junegrass
Bebbwillow/Sedge
Basket willow/Sedge
Flat leaved willow/Sedge
Myrtle lv'd willow/Sedge
Grazed
Grazed
Grazed
Bebb willow/Kentucky bluegrass
Basket willow/Kentucky bluegrass
Flat leaved willow/Kentucky bluegrass
River

Figure 5. Landscape profile of the Montane shrubland community types.

MONTANE SUBREGION

SHRUBLAND COMMUNITY TYPES

Photo 7: This photo represents a Basket willow/Sedge community type. These shrublands are found in valley depressions and are wet for much of the year. They provide excellent browse for wildlife.

D1. Yellow Mountain Avens-River Alder/ Low Forb
(Dryas drummondii-Alnus tenuifolia/Low forb)

n=1 This community type is found on an open, south-facing slope which supports a few scattered balsam poplar trees. The abundance of river alder and presence of balsam poplar indicates that this is a moist, nutrient-rich seep. In contrast yellow mountain avens grows favorably on open, well-drained sites and is typical of dry, gravelly river flats throughout Alberta. Willoughby (2001) described a Balsam poplar-White spruce/Willow/Yellow mtn. avens community type that is similar, but successionally more mature in the Upper Foothills subregion. In the absence of disturbance, river alder and balsam poplar will increase causing mountain avens to decrease as the site becomes shaded. Eventually this site will succeed to white spruce forest. This community type would be found upslope from the Yellow mtn. avens-Silverberry/Junegrass community type (D2) which is found on the level river flats.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	5	-	100
SHRUBS			
WHITE SPRUCE SEEDLINGS *(Picea glauca)*	3	-	100
LODGEPOLE PINE SEEDLINGS *(Pinus contorta)*	1	-	100
RIVER ALDER *(Alnus tenuifolia)*	10	-	100
DWARF SHRUBS			
YELLOW MTN. AVENS *(Dryas drummondii)*	25	-	100
FORBS			
COMMON YARROW *(Achillea millefolium)*	1	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	1	-	100
DANDELION *(Taraxacum officinale)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC
NUTRIENT REGIME:
MESOTROPHIC
ELEVATION:
1210 M
ASPECT:
SOUTHWEST
SLOPE:
10%
SOIL DRAINAGE:
WELL
ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	0
FORBS	10
SHRUBS	200
TOTAL	210 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
0.85 HA/AUM OR
0.05 AUM/AC

D2: Yellow Mountain Avens/Junegrass

(Dryas drummondii/Koeleria macrantha)

n=2 This community type is typical of dry, gravelly river flats with nutrient poor soils. Mountain avens, silverberry, bearberry, juniper and junegrass are all characteristic of dry, rapidly-drained soils. Willoughby (2001) also describe a similar community type on dry, gravelly, well-drained river flats in the Upper Foothills Subregion. The poor soil conditions limits the forage productivity and amount of regrowth after grazing. This community type should be rated as secondary or non-use range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE			
(Picea glauca)	1	0-2	50
TREMBLING ASPEN			
(Populus tremuloides)	1	0-1	50
SHRUBS			
SILVERBERRY			
(Elaeagnus commutata)	5	0-10	50
CREEPING JUNIPER			
(Juniperus horizontalis)	1	0-1	50
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	2	1-3	100
DWARF SHRUBS			
YELLOW MTN. AVENS			
(Dryas drummondii)	35	23-47	100
COMMON BEARBERRY			
(Arctostaphylos uva-ursi)	2	0-4	50
FORBS			
COMMON YARROW			
(Achillea millefolium)	4	0-8	50
REFLEXED LOCO-WEED			
(Oxytropis deflexa)	3	0-5	50
CUT-LEAVED ANEMONE			
(Anemone multifida)	1	1	100
GRASSES			
JUNEGRASS			
(Koeleria macrantha)	21	1-40	100
AWNLESS BROME			
(Bromus inermis)	1	0-2	50
MARSH REED GRASS			
(Calamagrostis canadensis)	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC-SUBXERIC

NUTRIENT REGIME: SUBMESOTROPHIC

ELEVATION: 1210-1848(1529) M

ASPECT: EAST

SLOPE: 1%

SOIL DRAINAGE: VERY RAPIDLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	200
FORBS	10
SHRUBS	50
TOTAL	260*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
0.85 HA/AUM OR
0.05 AUM/AC

D2a: Drummond's willow

(Salix drummondiana)

n=1 This community type was described next to the Oldman river on a recent river bar that is periodically flooded. Drummond's willow is well adapted to growing in a variety of soil conditions, but it prefers growing on well aerated soils. It is well adapted to growing at higher elevations and is often associated with the subalpine. Drummond's willow communities tend to be long-lived and are often maintained by frequent flooding. If the water shifts and the site drys out it will often undergo succession to a white spruce dominated forest. The dense nature of this community type often limits livestock movement. It should be rated as non-use.

PLANTCOMPOSITIONCANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	1	-	100
SHRUBS			
SILVERBERRY *(Elaeagnus commutata)*	3	-	100
DRUMMOND'S WILLOW *(Salix drummondiana)*	60	-	100
MYRTLE LEAVED WILLOW *(Salix myrtillifolia)*	3	-	100
FORBS			
CANADA THISTLE *(Cirsium arvense)*	10	-	100
MACCALLA'S ASTER *(Aster maccallae)*	3	-	100
FIREWEED *(Epilobium angustifolium)*	3	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	10	-	100
SMOOTH BROME *(Bromus inermis)*	20	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1400 M

ASPECT: SOUTH

SLOPE: 1%

SOIL DRAINAGE: Well

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	100
FORBS	100
SHRUBS	500
TOTAL	700*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.6 HA/AUM OR
0.15 AUM/AC

D3: Beaked Willow/Hairy Wild Rye
(Salix bebbiana/Elymus innovatus)

n=2 This community type represents a drier upland willow type which can be found on north-facing slopes, ravines and seepage areas. This community type was described in Banff and Jasper National Parks. The moisture and nutrient regimes favor an abundance of willow and the presence of a few scattered spruce trees. Beaked willow is highly palatable to wild ungulates, therefore, this community should be considered important wildlife habitat. In the absence of disturbance, this community type will likely succeed to white spruce.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	3	0-5	50
SHRUBS			
BEAKED WILLOW *(Salix bebbiana)*	8	0-15	50
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	8	1-15	100
WHITE SPRUCE SEEDLINGS *(Picea glauca)*	4	3-5	100
WILLOW *(Salix spp.)*	4	2-5	100
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	6	1-10	100
COMMON YARROW *(Achillea millefolium)*	3	0-5	50
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-5	50
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-5	50
ALPINE HEDYSARUM *(Hedysarum alpinum)*	3	0-5	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	38	15-60	100
WIRE RUSH *(Juncus balticus)*	3	0-5	50
BLUEGRASS *(Poa spp.)*	3	0-5	50
TIMOTHY *(Phleum pratense)*	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION(mean): 1000 - 1060 M (1030 M)

ASPECT: VARIABLE

SLOPE: 0-5%

SOIL DRAINAGE: MODERATELY WELL

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

:

TOTAL 1154*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.3 HA/AUM OR
0.3 AUM/AC

D3a: Bebb willow/Marsh reedgrass

(Salix bebbiana/Calamagrostis canadensis)

n=1 This community type was described at Beauvais Provincial Park. It represents a mosaic of willow clumps amid a mainly graminoid matrix. In general Bebb willow is often associated with better drained soils than the Basket or Flat leaved willow dominated community types. The presence of Baltic rush and marsh reedgrass indicates that this site is better drained than the Basket and Flat leaved willow/ Sedge dominated community types described later in the guide. The open nature of this site and the drier site conditions would favour livestock use. Heavy livestock use will favour the growth of Kentucky bluegrass and timothy and would resemble the Bebb willow/Kentucky bluegrass dominated community type.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR			
(Populus balsamifera)	1	-	100
SHRUBS			
BEAKED WILLOW			
(Salix bebbiana)	20	-	100
MYRTLE LEAVED WILLOW			
(Salix myritillifolia)	20	-	100
FORBS			
SWAMP HORSETAIL			
(Equisetum fluviatile)	10	-	100
YELLOW AVENS			
(Geum aleppicum)	10	-	100
Arrow leaved coltsfoot			
(Petasites sagittatus)	3	-	100
LYALL'S ANGELICA			
(Angelica arguta)	3	-	100
GRASSES			
MARSH REEDGRASS			
(Calamagrostis canadensis)	10	-	100
WIRE RUSH			
(Juncus balticus)	20	-	100
WATER SEDGE			
(Carex aquatilis.)	10	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION(mean): 1363 m

ASPECT: VARIABLE

SLOPE: 0-5%

SOIL DRAINAGE: MODERATELY WELL

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

:

GRASS	1000
FORBS	200
SHRUBS	200
TOTAL	1400*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.2 HA/AUM OR
0.3 AUM/AC

D4: Bebb willow/Kentucky bluegrass

(Salix bebbiana/Poa pratensis)

n=11 This community type is very similar to the Bebb willow/Hairy wild rye or Bebb willow/Marsh reedgrass community type, however, this community type has been altered by grazing. The grazing pressure has promoted the establishment of timothy, Kentucky bluegrass and dandelion. These sites are often very productive because of the higher nutrients and moisture and once Kentucky bluegrass and timothy become established these sites will be readily grazed by livestock. In the absence of disturbance this type will likely succeed to white spruce.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
SHRUBS			
FLAT LEAVED WILLOW *(Salix planifolia)*	4	0-20	36
PRICKLY ROSE *(Rosa acicularis)*	2	0-15	63
BEBB WILLOW *(Salix bebbiana)*	39	10-80	100
WILD RED RASPBERRY *(Rubus idaeus)*	1	0-10	27
RED-OSIER DOGWOOD *(Cornus stolonifera)*	1	0-3	27
FORBS			
NETTLE *(Urtica spp.)*	2	0-25	27
WILD VETCH *(Vicia americana)*	2	0-6	91
DANDELION *(Taraxacum officinale)*	4	0-20	82
HORSETAIL *(Equisetum arvense)*	3	0-10	55
GRASSES			
TIMOTHY *(Phleum pratense)*	12	0-50	73
KENTUCKY BLUEGRASS *(Poa pratensis)*	8	0-40	91
SMOOTH BROME *(Bromus inermis)*	9	0-80	27

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1416(1218-1510) M

SOIL DRAINAGE: IMPERFECTLY

ECOLOGICAL STATUS SCORE: 16 OR 8

FORAGE PRODUCTION (KG/HA)

GRASS	750
FORBS	250
SHRUB	500
TOTAL	1500*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.2 HA/AUM OR
0.32 AUM/AC

D5: Green Alder-Scouler's Willow-Wild Red Raspberry
(Alnus crispa-Salix scouleriana-Rubus idaeus)

n=2 This community type is generally found on mesic to hygric lower subalpine sites on moderate northerly slopes. Soils are moderately well to well-drained on morainal landforms with the community occurring in seepage areas (Corns and Achuff, 1982). This type is similar to Jaques and Corbin's (1981) Scouler's willow-Beaked willow type. It is also comparable to the Willow-Alder-Low bush cranberry/Shield fern type described by Lane et al. (2000) in the Lower Foothills subregion on similar site types. *Salix scouleriana* dominates the overstory and alder makes up a major portion of the understory cover. Dominance of alder may indicate a recent fire or other disturbance in the understory since alder regenerates faster than *Salix scouleriana*. White spruce, aspen, balsam poplar and lodgepole pine can often be found regenerating in this community type, therefore this community type will likely succeed to white spruce (Corns and Achuff, 1982).

Plant Composition	Canopy Cover (%) Mean	Range	Const.
Shrubs			
Green alder *(Alnus crispa)*	43	5-80	100
Scouler's willow *(Salix scouleriana)*	35	10-60	100
Wild red raspberry *(Rubus idaeus)*	21	1-40	100
Prickly rose *(Rosa acicularis)*	8	0-15	50
Forbs			
Veiny meadow rue *(Thalictrum venulosum)*	10	0-20	50
Western Canada violet *(Viola canadensis)*	8	0-15	50
Red and white baneberry *(Actaea rubra)*	5	0-10	50
Bunchberry *(Cornus canadensis)*	3	0-5	50
Grasses			
Hairy wild rye *(Elymus innovatus)*	3	1-5	100
Marsh reedgrass *(Calamagrostis canadensis)*	3	0-5	50

ENVIRONMENTAL VARIABLES

Moisture regime: Mesic to Subhygric

Nutrient regime: Mesotrophic to Permesotrophic

Elevation(mean): 1270-1580 m (1425 m)

Aspect: Northerly

Slope: 12-75%

Soil drainage: Well

Ecological Status score: 24 or 16

FORAGE PRODUCTION (KG/HA)

Grass	0
Forbs	10
Shrubs	150
Total	160*Estimate

Ecologically sustainable stocking rate
Generally Non-use
>10 ha/AUM or
<0.04 AUM/ac

D6: Flat-Leaved Willow/Quackgrass-Kentucky Bluegrass

(Salix planifolia/Agropyron repens-Poa spp.)

n=2 This community type represents a disturbed willow shrubland. *Salix planifolia* prefers areas where the water table is shallow, and is found adjacent to riparian areas, fens, swamps and lakeshores. Heavy grazing of this type has affected the understory vegetation allowing an increase in quackgrass and Kentucky bluegrass on the drier areas. The proximity to water and shallow water table would explain the heavy use by livestock as well as the high production. Care must be taken to ensure that the riparian habitat is not over-used by livestock.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
FLAT-LEAVED WILLOW *(Salix planifolia)*	41	25-56	100
DWARF BIRCH *(Betula pumila)*	1	0-1	50
FORBS			
MARSH VIOLET *(Viola palustris)*	3	0-6	50
RUSH ASTER *(Aster borealis)*	2	0-3	50
GRASSES			
QUACKGRASS *(Agropyron repens)*	18	0-35	50
KENTUCKY BLUE GRASS *(Poa pratensis)*	18	0-35	50
BLUE GRASS *(Poa spp.)*	9	0-17	50
GREEN SEDGE *(Carex viridula)*	4	0-7	50
ALPINE RUSH *(Juncus alpinus)*	4	0-7	50
BEAKED SEDGE *(Carex rostrata)*	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO HYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION(MEAN): 990-1160 M (1075 M)

SOIL DRAINAGE: WELL TO POORLY

ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

GRASS	2000
FORBS	200
SHRUB	300
TOTAL	2500*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.7 HA/AUM OR
0.55 AUM/AC

D7: Flat leaved willow/Horsetail/Sedge
(Salix planifolia/Equisetum arvense/Carex spp.)

n=6 This is a highly unusual community type for the montane. It will likely only be found at the lower elevational limits of the montane subregion. Corns and Achuff (1982) describe this community type on hygric, level to gently sloping fluvial landforms of various aspects. The soils are imperfectly to poorly drained and are subject to periodic flooding and sediment deposition. Tree cover is absent and willow cover is high. Field horsetail is the dominant herb. Other species may also be found, such as dwarf shrubs and sedges, however, these are minor components.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
SHRUBS			
FLAT LEAVED WILLOW *(Salix planifolia)*	33	20-40	100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	1	0-3	33
Bebb willow *(Salix bebbiana)*	7	0-20	83
MYRTLE LEAVED WILLOW (*Salix myrtillifolia*)	8	0-20	83
FORBS			
FIELD HORSETAIL *(Equisetum arvense)*	14	1-40	100
FIREWEED *(Epilobium angustifolium)*	4	0-20	67
LARGE LEAVED AVENS *(Geum macrophyllum)*	2	0-10	50
LYALL'S ANGELICA *(Angelica arguta)*	1	0-3	67
GRAMINOIDS			
BEAKED SEDGE (*Carex rostrata*)	3	0-10	67
KENTUCKY BLUEGRASS (*Poa pratensis*)	2	0-10	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1315(980-1420) M

SOIL DRAINAGE: IMPERFECTLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	0
FORBS	300
SHRUB	200
TOTAL	500*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
3.6 HA/AUM OR
0.13 AUM/AC

D8: Myrtle leaved willow/Sedge
(Salix myrtillifolia/Carex rostrata)

n=12 This community type is similar to the Willow-Bog birch/Sedge community type of Lane et al (2000). It represents a typical willow/sedge community type found on wet, poorly drained soils. There are numerous different species of willow as a result of the open canopy and the wet moisture regime. A high cover of beaked sedge indicates a nitrogen-rich environment where the water is moving. Tufted hair grass (*Deschampsia cespitosa*) will replace marsh reedgrass in this community type at higher elevations (Lane et al, 2000). This would be considered an edaphic climax community since the area is frequently flooded which prevents establishment of trees although it may be found in association with black spruce and black spruce-larch community types. This community type would be considered non-use for livestock due to the poor access caused by the wet substrate.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
MYRTLE LEAVED WILLOW *(Salix spp.)*	34	5-86	100
BOG BIRCH *(Betula glandulosa)*	12	0-32	50
SHRUBBY WILLOW *(Salix arbusculoides)*	1	0-8	18
FORBS			
ARROW-LEAVED COLTSFOOT *(Petasites saggitatus)*	2	0-18	18
LARGE-LEAVED AVENS *(Geum macrophyllum)*	2	0-13	17
LINDLEYS ASTER *(Aster ciliolatus)*	3	0-13	58
STRAWBERRY (*Fragaria virginiana*)	2	0-12	42
GRASSES			
SEDGE *(Carex rostrata, C. aquatilis)*	26	3-70	100
MARSH REEDGRASS *(Calamagrostis canadensis)*	4	0-22	33
WIRE RUSH *(Juncus balticus)*	5	0-18	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYDRIC-HYGRIC

NUTRIENT REGIME : MESOTROPHIC-PERMESOTROPHIC

ELEVATION(MEAN): 1241-1524(1450) M

SOIL DRAINAGE: IMPERFECTLY- VERY POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	714(422-1132)
FORBS	485(24-1818)
SHRUB	301(204-710)
TOTAL	1500(740-2522)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
1.2 (2.5-0.7) HA/AUM OR
0.35 (0.17-0.56) AUM/AC

D9: Basket Willow/Sedge

(Salix petiolaris/Carex spp.)

n=3 Basket willow prefers growing on well to moderately-well drained soils. The soils of this community type tend to be drier than the Myrtle leaved and Flat leaved willow community types, but are wetter than the Bebb willow dominated types. Basket willow is not particularly palatable to wild ungulates, however the understory shrubs and forbs can provide a substantial amount of forage. Heavy grazing of this community type will allow Kentucky bluegrass and timothy to invade to form the Basket willow/Kentucky bluegrass dominated community type

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
SHRUBS			
BOG BIRCH *(Betula glandulosa)*	13	0-23	67
BASKET WILLOW *(Salix petiolaris)*	43	23-68	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-9	67
HOARY WILLOW *(Salix candida)*	8	0-23	67
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	5	2-8	100
FIREWEED *(Epilobium angustifolium)*	2	2-2	100
PURPLE AVENS *(Geum rivale)*	2	0-5	33
SMOOTH ASTER *(Aster laevis)*	5	0-15	33
GRASSES			
WIRE RUSH *(Juncus balticus)*	5	1-10	100
BEAKED SEDGE *(Carex rostrata)*	5	0-8	67
GRACEFUL SEDGE *(Carex praegracilis)*	2	0-7	33
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	3	0-7	67
MARSH REEDGRASS *(Calamagrostis canadensis)*	21	0-6	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYDRIC

NUTRIENT REGIME :
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION:
1440 M

SLOPE:
0-6%

ASPECT:
NORTHERLY

SOIL DRAINAGE:
WELL TO POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1270
FORBS	372
SHRUB	0
TOTAL	1642

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.1 HA/AUM OR
0.35 AUM/AC

D9a: Basket Willow/Kentucky bluegrass

(Salix petiolaris/Poa pratensis)

n=2 This community type represents a grazing disclimax of the Basket willow/Sedge dominated community type. Basket willow is not particularly palatable to livestock, but heavy grazing of the understory will allow Kentucky bluegrass and timothy to invade. Once established these introduced species are very palatable to livestock and this community type would be extensively utilized by livestock because of the high moisture and nutrients on the site.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
BOG BIRCH (*Betula glandulosa*)	2	1-23	100
BASKET WILLOW *(Salix petiolaris)*	50	30-70	100
FLAT LEAVED WILLOW *(Salix planifolia)*	2	0-3	50
FORBS			
CANADA THISTLE *(Cirsium arvense)*	2	0-3	50
DANDELION *(Taraxacum officinale)*	1	1-2	100
LARGE LEAVED AVENS *(Geum macrophyllum)*	6	2-10	100
SMOOTH ASTER *(Aster laevis)*	4	0-8	50
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	9	9-10	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	17	13-20	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC-SUBHYDRIC

NUTRIENT REGIME : PERMESOTROPHIC

ELEVATION: 1410-1480(1445) M

SLOPE: 2%

ASPECT: NORTHERLY

SOIL DRAINAGE: MOD. WELL

ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

GRASS	500
FORBS	188
SHRUB	808
TOTAL	1496

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.2 HA/AUM OR
0.35 AUM/AC

D10: Dwarf Birch-Shrubby Cinquefoil/Northern Valerian/Sedge

(Betula pumila-Potentilla fruticosa/Valeriana dioica/Carex spp.)

n=2 This community type occurs on hummocky terrain. On wet, marshy sites, *Betula pumila*, *Salix glauca*, *Salix maccalliana* and *Carex aquatilis* are found. On the drier, subhygric hummocks, grassy open areas are dominated by *Potentilla fruticosa*, *Deschampsia cespitosa*, and *Elymus innovatus*. The drier hummocks would be the only areas useful for domestic livestock,but may be difficult to access if the low areas are flooded. Therefore, this community type should be considered secondary range for domestic livestock.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
SHRUBS			
DWARF BIRCH *(Betula pumila)*	23	20-25	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	18	15-20	100
SMOOTH WILLOW *(Salix glauca)*	13	10-15	100
VELVET-FRUITED WILLOW *(Salix maccalliana)*	15	0-30	50
FORBS			
NORTHERN VALERIAN *(Valeriana dioica)*	5	2-8	100
SHOWY EVERLASTING *(Antennaria pulcherrima)*	1	1	100
FIREWEED *(Epilobium angustifolium)*	1	1	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	1	100
ELEPHANT'S HEAD *(Pedicularis groenlandica)*	3	0-5	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	2	2	100
SEDGE *(Carex spp.)*	20	0-40	50
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	13	0-25	50
RUSH-LIKE SEDGE *(Carex scirpoidea)*	8	0-15	50
WATER SEDGE *(Carex aquatilis)*	4	0-8	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION(MEAN): 1390-1440 M (1415 M)

SOIL DRAINAGE: IMPERFECTLY TO POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1500
FORBS	200
SHRUB	300
TOTAL	2000*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.9 HA/AUM OR
0.45 AUM/AC

D11: White Spruce-Willow/Water Sedge/Golden Moss

(Picea glauca-Salix spp./Carex aquatilis/Tomenthypnum nitens)

n=2 This community type represents a wet willow shrubland succeeding to white spruce. The high water sedge and golden moss cover indicates a calcium-rich environment (Beckingham, 1994; MacKinnon et al., 1992). As organic matter accumulates and the site becomes drier, willow and spruce will increase in cover. This community would be considered non-use for domestic livestock, however, *Salix arbusculoides* and *Salix bebbiana* are very palatable to wild ungulates, therefore, this type could be considered important wildlife habitat.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
WHITE SPRUCE SEEDLINGS *(Picea glauca)*	2	1-4	100
SHRUBBY WILLOW *(Salix arbusculoides)*	18	0-35	50
DWARF BIRCH *(Betula pumila)*	4	0-8	50
BEAKED WILLOW *(Salix bebbiana)*	4	0-8	50
COMMON LABRADOR TEA *(Ledum groenlandicum)*	2	0-3	50
LODGEPOLE PINE SEEDLINGS *(Pinus contorta)*	1	0-2	50
FORBS			
RUSH ASTER *(Aster borealis)*	1	1	100
WILD STRAWBERRY *(Fragaria virginiana)*	1	1	100
SWAMP HORSETAIL *(Equisetum fluviatile)*	10	0-20	50
DEWBERRY *(Rubus pubescens)*	1	0-2	50
GRASSES			
WATER SEDGE *(Carex aquatilis)*	29	20-38	100
BEAKED SEDGE *(Carex rostrata)*	3	0-5	50
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	0-1	50
MOSSES			
GOLDEN MOSS *(Tomenthypnum nitens)*	42	18-65	100
RUSTY PEAT MOSS *(Sphagnum fuscum)*	8	0-15	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYDRIC

NUTRIENT REGIME: EUTROPHIC

ELEVATION: 1240 M

ASPECT: VARIABLE

SLOPE: 0-2 %

SOIL DRAINAGE: VERY POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	750
FORBS	100
SHRUB	400
TOTAL	1250*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
1.5 HA/AUM OR
0.27 AUM/AC

D12: Black Spruce/Myrtle-Leaved Willow/Wire Rush-Sedge/Moss

(Picea mariana/Salix myrtillifolia/Juncus balticus-Carex spp./ Moss spp.)

n=3 This community type represents a wet willow shrubland succeeding to black spruce. It is most simlar to the Bog birch-Basket willow-Myrtle-leaved willow community type (D9), however this one is successionally more advanced. *Salix myrtillifolia* is characteristic of mossy bogs, muskegs and moist conifer forests (Jaques and Corbin, 1981). This would be considered non-use for domestic livestock and wildlife because *Salix myrtillifolia* is generally unpalatable.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	7	0-10	67
SHRUBS			
BLACK SPRUCE SEEDLINGS *(Picea mariana)*	15	1-40	100
LABRADOR TEA *(Ledum groenlandicum)*	3	1-5	100
MYRTLE-LEAVED WILLOW *(Salix myrtillifolia)*	25	0-50	67
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	4	0-10	67
DWARF BIRCH *(Betula pumila)*	3	0-5	67
PRICKLY ROSE *(Rose acicularis)*	2	0-5	67
FORBS			
DWARF SCOURING RUSH *(Equisetum scirpoides)*	2	0-5	67
NORTHERN BED STRAW *(Galium boreale)*	1	0-2	67
GRASSES			
WIRE RUSH *(Juncus balticus)*	14	1-30	100
SHEATHED SEDGE *(Carex vaginata)*	15	0-40	67
HAIR-LIKE SEDGE *(Carex capillaris)*	2	0-3	67
NEBRASKA SEDGE *(Carex nebraskensis)*	5	0-15	33
MOSSES			
GOLDEN MOSS *(Tomenthypnum nitens)*	10	0-30	67
TUFTED MOSS *(Aulacomnium palustre)*	4	0-10	67
BROWN MOSS *(Drepanocladus revolvens)*	7	0-20	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION(MEAN): 1290-1300 M (1295 M)

SOIL DRAINAGE: POORLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	350
FORBS	50
SHRUB	500
TOTAL	900*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2 HA/AUM OR
0.2 AUM/AC

D13: Water birch-Smooth willow/Pinegrass

(Betula occidentale-Salix glauca/Calamagrostis rubescens)

n=1 This community was described on a hilltop depression which supports a high moisture and nutrient regime. The depression also provides protection from the prevailing winds. Therefore, shrubs are abundant, however, due to wet conditions at the bottom of the depression, trees will likely only develop on the drier edges. The surrounding wind-exposed areas support grassland vegetation, therefore, this community type would provide good shelter for livestock later in the fall when the site had dried.

PLANT COMPOSITION	CANOPY COVER (%)		
	Mean	Range	Const.
Shrubs			
Bracted honeysuckle *(Lonicer involcrata)*	6	-	100
Water birch *(Betula occidentale)*	21	-	100
Smooth willow *(Salix glauca)*	21	-	100
Snowberry *(Symphoricarpos occidentalis)*	15	-	100
Forbs			
Showy aster *(Aster conspicuus.)*	10	-	100
Strawberry *(Fragaria virginiana)*	8	-	100
Wintergreen *(Pyrola asarifolia)*	7	-	100
Smooth aster *(Aster laevis)*	7	-	100
Grasses			
Pinegrass *(Calamagrostis rubescens)*	15	-	100
Prairie sedge *(Carex prairea)*	1	-	100

ENVIRONMENTAL VARIABLES

Moisture regime: Subhygric

Nutrient regime: Permesotrophic

Elevation: 1600 m

Soil drainage: Poorly

Ecological Status score: 24

FORAGE PRODUCTION (KG/HA)

Total 1500*Estimate

Ecologically sustainable stocking rate
1.2 ha/AUM or
0.33 AUM/ac

D14: Hawthorn-Snowberry/Kentucky bluegrass

(Crataegus rotundifolia-Symphoricarpos albus/Poa pratensis)

n=2 This community can be found on alluvial terraces along streams and rivers or on slopes immediately below a spring or seep (Thompson and Hansen 2002). Thompson and Hansen (2002) described this community type in the Cypress Hills, but it has been observed in the Castle and South Castle drainages. Where this community type forms dense thickets there is little use by livestock. However, severe prolonged disturbance in the more open stands can lead to the invasion of Kentucky bluegrass and timothy to form this community type. Succession in the absence of disturbance will likely be to aspen and then white spruce.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	2	0-3	50
SHRUBS			
HAWTHORN *(Crataegus rotundifolia)*	70	70-70	100
PRICKLY ROSE *(Rosa acicularis)*	3	3-3	100
CHOKECHERRY *(Prunus virginiana)*	5	0-10	50
SNOWBERRY *(Symphoricarpos albus)*	17	3-30	100
FORBS			
COW PARSNIP *(Heracleum lanatum.)*	7	3-10	100
STRAWBERRY *(Fragaria virginiana)*	3	3-3	100
DANDELION *(Taraxacum officinale)*	3	3-3	100
AMERICAN VETCH *(Vicia americanum)*	2	1-3	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	17	3-30	100
SPRENGEL'S SEDGE *(Carex sprengelii)*	10	1-20	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1300(1234-1365) M

SOIL DRAINAGE: POORLY

ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

TOTAL 1154*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.8 HA/AUM OR
0.5 AUM/AC

MONTANE FOREST ECOLOGY

The Montane subregion is distinguished from other subregions by having two distinct ecological sequences: Douglas-fir (Fd) and limber pine (Pf) in one sequence, and lodgepole pine(Pl) in another (Figure 4). Douglas-fir is the climax species on steep, south-facing, shallow rocky soils, and very coarse-textured outwash in valley bottoms (Strong 1992). Limber pine occupies exposed rocky outcrops where the environmental conditions are extreme. These sites are very xeric with shallow, poorly developed soils. Kuchar (1973) noted that the limber pine in Alberta is found at the northern limit of its range since it is found well below timberline. It is normally associated with high elevations or timberline south of Alberta where it takes on a krummholz form (dwarfed, contorted form, maintained by strong winds).

Closed-canopied lodgepole pine stands represent the primary reference vegetation for the montane subregion, since they often occur on mesic sites (Strong 1992). In contrast, closed-canopied aspen(Aw) stands tend to occur on sites that are warmer and drier than the reference sites (Strong 1992). Douglas-fir and white spruce(Sw) represent the potential climatic climax species for both lodgepole pine and aspen stands (Strong 1992; La Roi and Hnatiuk 1980). Balsam poplar(Pb), however, occupies the moistest sites and will succeed to white spruce since the high moisture content is not conducive to Douglas-fir succession.

Common understory species include thimbieberry, creeping mahonia, Canada buffaloberry, bearberry, snowberry and white meadowsweet. These species tend to define the ecosites and ecosite phases as described by Archibald et al. (1996). Thimbleberry and creeping mahonia are more common in the Castle area of the province. Moving north of Blairmore in the Montane thimbleberry is often replaced by cow parsnip and creeping mahonia by white meadowsweet on similar ecosites.

Many of the forested communities at lower elevations (1400-1500 m) in the Castle area were dominated by subalpine species (subalpine fir(Fa), Engelmann spruce(Se)), whereas the Montane grasslands in this area were described up to elevations of 2000 m. This resulted in a broad range of characteristic species on modal sites. Archibald et al. (1996) felt there had to be further refinement of the Subalpine subregion into upper and lower latitudinal subdivisions. Clearly, this would help to refine the classification of community types in the Castle area.

The common species, canopy cover, community characteristics and productivity are outlined.

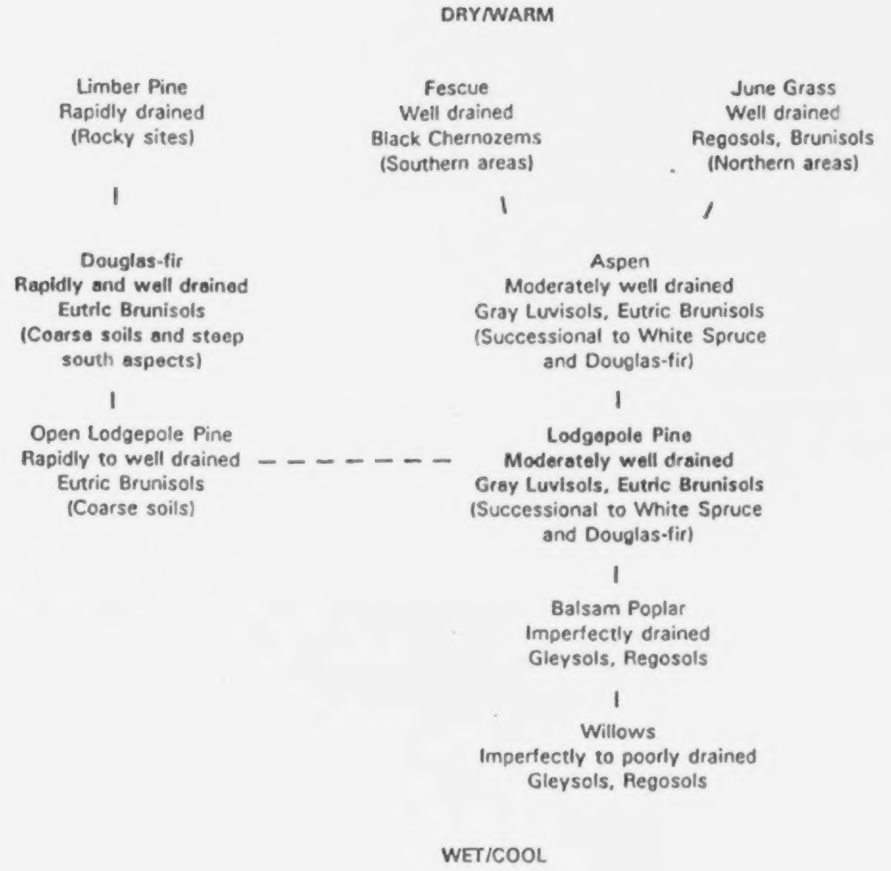
DRY/WARM
Limber Pine
Rapidly drained
(Rocky sites)
Fescue
Well drained
Black Chernozems
(Southern areas)
June Grass
Well drained
Regosols, Brunisols
(Northern areas)
Douglas-fir
Rapidly and well drained
Eutric Brunisols
(Coarse soils and steep south aspects)
Aspen
Moderately well drained
Gray Luvisols, Eutric Brunisols
(Successional to White Spruce and Douglas-fir)
Open Lodgepole Pine
Rapidly to well drained
Eutric Brunisols
(Coarse soils)
Lodgepole Pine
Moderately well drained
Gray Luvisols, Eutric Brunisols
(Successional to White Spruce and Douglas-fir)
Balsam Poplar
Imperfectly drained
Gleysols, Regosols
Willows
Imperfectly to poorly drained
Gleysols, Regosols
WET/COOL

Figure 6: Ecological sequence of the plant communities in the Montane subregion along an environmental gradient (Strong 1992)

Table 4. Conifer, Mixedwood and Deciduous community types in the Montane subregion.

Carrying Community number	Community type	Productivity (kg/ha)				Moisture	Drainage	Capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
	Conifer community types							
E1	Pf/Rough fescue	-	-	-	1500*	Subxeric	Well	1.2
E2	Pf-Fd/Juniper/Bearberry	-	-	-	350*	Xeric	Rapidly	2.6
E3	Pl/Bearberry-Juniper	97	150	350	597	Xeric	Rapidly	3.0
E4	Sw-Pl/Alder/Bearberry	-	-	-	850*	Subxeric	Rapidly	2.1
E5	Pl/Buffaloberry/Pinegrass	804	282	50	1172	Submesic	Well	1.6
E6	Fd/Hairy wildrye	212	168	61	441	Mesic	Well	4.1
E6a	Fd/Needle litter	330	33	68	431	Submesic	Well	4.2
E6b	Fd/Timothy	984	172	-	1156	Submesic	Mod.well	1.6
E7	Pl/Low bilberry/Hairy wildrye	108	32	50	190	Mesic	Rapidly	9.0
E8	Pl/White meadowsweet	156	202	270	628	Submesic	Rapidly	2.9
E9	Pl/Pinegrass	253	180	86	518	Mesic	Well	3.5
E10	Sw-Fd/White meadowsweet	149	106	79	333	Mesic	Well	5.4
E10a	Fd/Snowberry	267	227	122	615	Mesic	Well	2.9
E11	Pl/Moss	243	433	30	706	Mesic	Well	2.7
E12	Sw/Moss	60	138	4	201	Mesic	Well	9.0
E12a	Sw/Horsetail	28	332	124	484*	Subhygric	Mod. Well	3.8
E12b	Sw/Silverberry/Horsetail	100	401	52	553*	Subhygric	Well	3.3
E13	Pl/Thimbleberry	320	460	191	976	Mesic	Well	1.9
E14	Pl/Thimbleberry/Beargrass	80	856	1010	1946	Submesic	Rapidly	1.9
E15	Pl/River alder-Thimbleberry	-	-	-	800*	Subhygric	Mod. Well	2.3
E16	Sw/Thimbleberry	18	130	100	248	Mesic	Well	3.0
E17	Sb-Lt/Labrador tea	-	-	-	500*	Hygric	Poorly	3.0
E18	Se/Grouseberry	430	484	156	1064	Mesic	Well	2.0

Table 4. Continued

Community number	Community type	Productivity (kg/ha)				Moisture	Drainage	Carrying Capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
E19	Se/Moss	60	212	62	334	Mesic	Well	5.4
E20	Fa-Pl-Sw/White meadowsweet/Pinegrass	845	537	177	1480	Mesic	Rapidly	1.5
E21	Fa-Se/Heart lv'd arnica	16	153	239	408	Mesic	Well	4.5
E22	Se/Clover-Oxeye daisy	-	-	-	604	Mesic	Well	3.8
Mixedwood community types								
F1	Aw-Fd/Bearberry	418	190	-	608	Submesic	Rapidly	3.0
F2	Sw-Pl/Yellow Mtn. avens	152	252	40	444	Submesic	Rapidly	4.0
F3	Aw-Pl/Buffaloberry/Hairy wildrye	-	-	-	350*	Submesic	Rapidly	4.0
F4	Aw-Pl/Pinegrass	600	384	0	984	Mesic	Well	2.6
F4a	Fd-Aw/Pinegrass	905	237	51	1192	Submesic	Well	1.5
F5	Aw-Sw/Blueberry	330	46	48	424	Mesic	Well	2.1
F6	Aw-Fd/White meadowsweet	-	-	-	800*	Mesic	Well	2.3
F7	Aw-Pb-Sw/Pinegrass	122	282	28	412	Mesic	Well	4.4
F8	Aw-Fa/Snowberry/Pinegrass	152	210	754	1116	Mesic	Well	1.6
F8a	Aw-Pl/Marsh reedgrass	1120	215	0	1336	Mesic	Well	1.4
F9	Pl-Aw/Snowberry/Kentucky bluegrass	668	774	506	1948	Submesic	Well	1.8
F10	Aw-Fa-Se/Timothy	1328	346	232	1906	Mesic	Well	1.8
F11	Spruce-Pb/Snowberry	97	681	237	1016	Subhygric	Well	1.8
F12	Sw-Aw/Scouring rush	-	-	-	800*	Subhygric	Mod. Well	2.2
Deciduous community types								
G1	Aw/Bearberry/Rough fescue	578	220	148	946	Submesic	Well	2.2
G2	Aw/Rose/Hairy wildrye	856	313	75	1244	Mesic	Well	1.5
G3	Aw/Hairy wildrye	836	1228	0	2064	Mesic	Well	1.5
G4	Aw/White meadowsweet/Pinegrass	882	470	75	1410	Mesic	Well	1.8

Table 4 continued

Community number	Community type	Productivity (kg/ha)				Moisture	Drainage	Carrying Capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
G5	Aw/Rose/Pinegrass	803	466	53	1332	Mesic	Well	1.3
G6	Aw/Pinegrass-Kentucky bluegrass	1005	584	126	1713	Mesic	Well	1.3
G7	Aw/Timothy-Kentucky bluegrass	1006	114	242	1362	Mesic	Well	1.3
G8	Aw/Snowberry-Saskatoon	653	406	335	1278	Mesic	Well	1.8
G9	Aw/Snowberry/Kentucky bluegrass	606	749	354	1709	Mesic	Well	1.8
G9a	Aw-Pb/Marsh reedgrass	1042	404	39	1485	Hygric	Well	1.2
G10	Aw/Thimbleberry	575	454	380	1410	Subhygric	Mod. Well	1.8
G11	Aw/Cow parsnip	525	2569	74	3169	Subhygric	Mod. Well	0.9
G12	Pb/Thimbleberry	36	1234	684	1954	Subhygric	Mod. Well	1.8
G13	Pb/Cow parsnip/Kentucky bluegrass	4	856	1010	1870*	Subhygric	Mod. Well	0.9
G14	Pb/Snowberry	382	483	893	1760	Mesic	Well	1.3
G15	Aw/Birch-Willow	804	452	622	1878	Subhygric	Mod. Well	1.5

*estimate

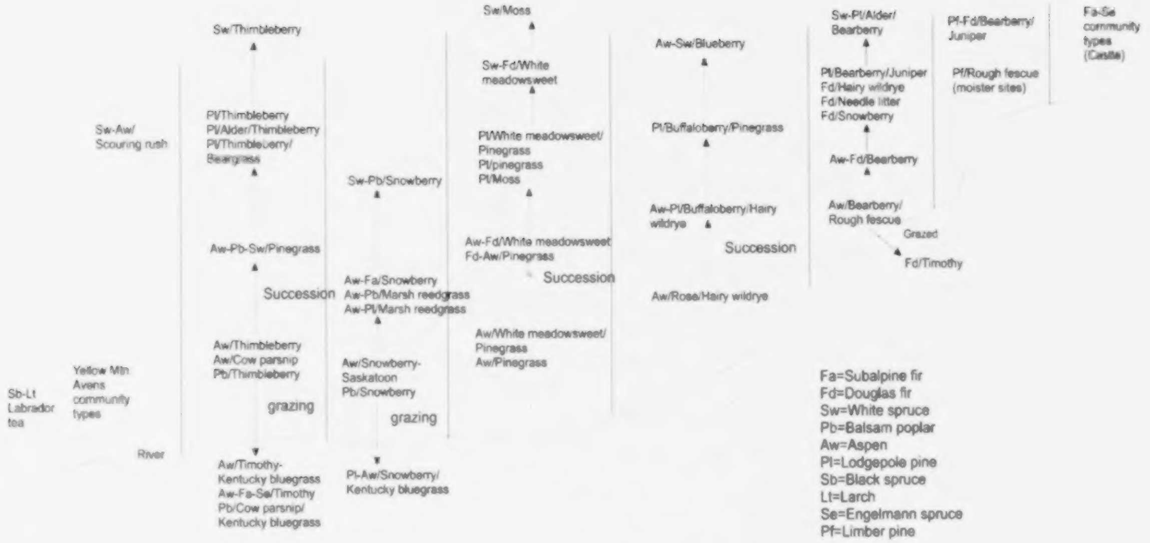
Sw/Thimbleberry
Sw-Aw/ Scouring rush
Pl/Thimbleberry
Pl/Alder/Thimbleberry
Pl/Thimbleberry/ Beargrass
Aw-Pb-Sw/Pinegrass
Succession
Aw/Thimbleberry
Aw/Cow parsnip
Pb/Thimbleberry
grazing
Aw/Timothy- Kentucky bluegrass
Aw-Fa-Se/Timothy
Pb/Cow parsnip/ Kentucky bluegrass
Sb-Lt Labrador tea
Yellow Mtn Avens community types
River
Sw-Pb/Snowberry
Aw-Fa/Snowberry
Aw-Pb/Marsh reedgrass
Aw-Pl/Marsh reedgrass
Aw/Snowberry- Saskatoon
Pb/Snowberry
grazing
Pl-Aw/Snowberry/ Kentucky bluegrass
Sw/Moss
Sw-Fd/White meadowsweet
Pl/White meadowsweet/ Pinegrass
Pl/pinegrass
Pl/Moss
Aw-Fd/White meadowsweet
Fd-Aw/Pinegrass
Succession
Aw/White meadowsweet/ Pinegrass
Aw/Pinegrass
Aw-Sw/Blueberry
Pl/Buffaloberry/Pinegrass
Aw-Pl/Buffaloberry/Hairy wildrye
Succession
Aw/Rose/Hairy wildrye
Sw-Pl/Alder/ Bearberry
Pl/Bearberry/Juniper
Fd/Hairy wildrye
Fd/Needle litter
Fd/Snowberry
Aw-Fd/Bearberry
Aw/Bearberry/ Rough fescue
Grazed
Fd/Timothy
Pf-Fd/Bearberry/ Juniper
Pf/Rough fescue (moister sites)
Fa-Se community types (Castle)
Fa=Subalpine fir
Fd=Douglas fir
Sw=White spruce
Pb=Balsam poplar
Aw=Aspen
Pl=Lodgepole pine
Sb=Black spruce
Lt=Larch
Se=Engelmann spruce
Pf=Limber pine

Figure 7. Landscape profile of the forested community types in the Montane subregion

MONTANE SUBREGION

CONIFEROUS COMMUNITY TYPES

Photo 8: Conifer: This is a Douglas-fir-White spruce community type. Where the canopy opens up, grasses are fairly abundant and provide good forage for wildlife and livestock. In the absence of disturbance, this site will likely succeed to white spruce.

Montane Coniferous key

1.	Wet, poorly drained, lowland boggy sites dominated by Black spruce and Larch, or riparian areas dominated by horsetail	**1a**	
	Drier upland sites dominted by spruce, Douglas fir or Pine species	**2**	
1a	Lowland boggy areas dominated by Sb and Lt	**Sb-Lt/Labrador tea**	e17
	Riparian areas (adjacent to streams and rivers) dominated by horsetail	**1b**	
1b	Moist area understory dominated by horsetail	**Sw/Horsetail**	e12a
	Old river bar dominated by silverberry and horsetail	**Sw/Silverberry/Horsetail**	e12b
	Site is well drained and drier, Black spruce and larch not present	**2**	
2.	Stand dominated by subalpine species; Subalpine fir, Engelmann spruce, Grouseberry, and False azalea	**3**	
	Stand not dominated by subalpine species but rather White spruce, Douglas fir, Aspen, Lodgepole pine, Limber pine, or Balsam poplar trees	**7**	
3.	Stand dominated by Engelmann spruce	**4**	
	Stand dominated by Subalpine fir	**6**	
4.	Site is grazed, contains species indicative of grazing; Clover, Ox-eye daisy	**Se/Clover-Oxeye daisy**	e22
	Site is ungrazed	**5**	
5.	Grouseberry dominates the understory	**Se/Grouseberry/Moss**	e18
	Moss dominates the understory	**Se/Moss**	e19
6.	Understory dominated by white meadowsweet	**Fa-Pl-Sw/White meadowsweet/Pinegrass**	e20
	Arnica dominates the understory	**Fa-Se/Heart-leaved arnica**	e21
7.	Drier upper slope position dominated by Limber pine, Douglas fir, Bearberry, or Juniper	**8**	
	Mesic sites, understory dominated by White meadowsweet, Pinegrass, Thimbleberry, Cow parsnip, and Moss. The overstory is dominated by Douglas fir, Lodgepole pine and White spruce	**16**	
8.	Limber pine dominates the community	**9**	
	Lodgepole pine or Douglas fir dominate the community	**10**	
9.	Rough fescue dominates the understory	**Pf/Rough fescue**	e1
	Bearberry dominates the understory	**Pf-Fd/Juniper/Bearberry**	e2
10.	Lodgepole pine dominates the community	**11**	
	Douglas fir dominates the community	**13**	
11.	Bearberry and Juniper dominate the understory. South slope and coarse textured soils lead to dry site conditions.	**Pl/Bearberry-Juniper**	e3
	Low bilberry,Hairy wildrye, Alder and/or Bearberry dominate the understory	**12**	
12	Low bilberry and Hairy wildrye dominated the understorey. Site is typically pine dominated stand adjacent to grasslands in the Ya Ha Tinda area	**Pl/Low bilberry/Hairy wildrye**	e7
	Alder and Bearberry dominate the understory and the site is a rapidly draining level area with poor nutrient regime	**Sw-Pl/Alder/Bearberry**	e4
13.	Site is grazed and is invaded by Timothy	**Fd/Timothy**	e6b
	Site is ungrazed and not invaded	**14**	
14.	Site has small individual Snowberry plants spread evenly thoughout the community.	**Fd/Snowberry**	e10a
	Site has very little or no understory forage	**15**	
15.	Site is a mature Douglas fir forest with a closed canopy and little or no understory vegetation	**Fd/needle litter**	e6a
	Site occurs on steep and dry areas or valley bottems with coarse textured outwash areas. There is a high cover of Douglas fir and a sparse understory	**Fd/Hairy wildrye**	e6
16.	Moist seepage areas with Cow parsnip and Thimbleberry	**17**	
	Drier sites with White meadowsweet, Pinegrass, Buffaloberry or Moss	**20**	
17.	Sw dominated sites	**Sw/Thimbleberry**	e16
	Pl dominated sites	**18**	
18.	River alder and Thimbleberry dominated	**Pl/River alder/Thimbleberry**	e15
	Thimbleberry and Beargrass dominated, or Thimbleberry dominated	**19**	
19.	Thimbleberry and Beargrass dominated	**Pl/Thimbleberry/Beargrass**	e14
	Thimbleberry dominate	**Pl/Thimbleberry**	e13
20.	Pl, Buffaloberry, Pinegrass dominated	**Pl/Buffaloberry/Pinegrass**	e5
	Sw, Pl dominate the overstory	**21**	
21.	Moss is a major component of the understory	**22**	
	Pinegrass is present in the understory	**23**	
22.	White spruce is the major overstory species	**Pl/Moss**	e11
	Lodgepole pine is the major overstory species	**Sw/Moss**	e12
23.	Sw, white meadowsweet, and pinegrass minimal	**Sw-Fd/White meadowsweet**	e10
	Pl dominated, white meadowsweet, Pinegrass co-dominant	**Pl/White meadowsweet, Pl/Pinegrass**	e8, e9

E1: Pf/Rough fescue

(Pinus flexilis/Festuca scabrella)

n=1 This community type was described on a steep, west-facing slope with a subxeric moisture regime. The high cover of rough fescue distinguishes this community from other, more typical limber pine dominated community types. This community probably has deeper soils and is likely protected to some extent from the dry, dessicating winds that are normally associated with limber pine community types (Corns and Achuff 1982). These conditions would favour the growth of rough fescue.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LIMBER PINE *(Pinus flexilis)*	20	-	100
DOUGLAS-FIR *(Pseudotsuga menziesii)*	2	-	100
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	5	-	100
CREEPING JUNIPER *(Juniperus horizontalis)*	2	-	100
BRISTLY BLACK CURRANT *(Ribes lacustre)*	1	-	100
FORBS			
GOLDEN BEAN *(Thermopsis rhombifolia)*	4	-	100
COMMON YARROW *(Achillea millefolium)*	1	-	100
PASTURE SAGEWORT *(Artemisia frigida)*	1	-	100
WILD BERGAMOT *(Monarda fistulosa)*	1	-	100
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	95	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	1	-	100
PARRY OAT GRASS *(Danthonia parryi)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1475 M

SOIL DRAINAGE: WELL

SLOPE: 40%

ASPECT: WEST

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL 1500 KG/HA*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.2 HA/AUM OR
0.33 AUM/AC

E2: Pf-Fd/Juniper/Bearberry

(Pinus flexilis-Pseudotsuga menziesii/Juniperus communis/Arctostaphylos uva-ursi)

n=6 This community type occurs on steep, exposed ridge tops and upper slope positions within the montane subregion. It is characterized by dry site conditions and exposure to westerly winds. Soils are often shallow to bedrock (Archibald et al 1996), This community often forms an edaphic climax on these sites. Limber pine is normally associated with high elevations or timberline where it attains a Krummholz form (Kuchar 1973). However, the montane regions of Southwestern Alberta are found at the northern limits of the range for limber pine, thus they can generally be found at the lower elevations between prairie and coniferous forest. Limber pine, bearberry, juniper and the other associated species of this community type are all well adapted to the low moisture levels, high light intensity, heat and low soil nutrient levels which occur on these erosional, south-facing scarps (Kuchar 1973). Utilization of this site by livestock is often difficult because of the steep slope. These sites are generally considered non-use.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
DOUGLAS-FIR *(Pseudotsuga menziesii)*	4	0-15	83
LIMBER PINE *(Pinus flexilis)*	18	10-30	100
LODGEPOLE PINE (*Pinus contorta*)	2	0-10	17
SHRUBS			
GROUND JUNIPER *(Juniperus horizontalis)*	3	0-15	50
COMMON JUNIPER (*Juniperus communis*)	5	0-15	67
SASKATOON *(Amelanchier alnifolia)*	4	0-10	83
FORBS			
CUT LV'D ANEMONE *(Anemone multifida)*	4	0-15	83
WILD STRAWBERRY *(Fragaria virginiana)*	1	0-5	50
BEARBERRY *(Arctostaphylos uva-ursi)*	11	0-63	17
NODDING ONION *(Allium cernuum)*	1	0-1	83
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	2	0-4	67
ROUGH FESCUE *(Festuca scabrella)*	4	0-14	67
PINEGRASS (*Calamagrostis rubescens*)	3	0-18	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: XERIC-SUBXERIC

NUTRIENT REGIME: SUBMESOTROPHIC TO MESOTROPHIC

ELEVATION:
1519(980-1845) M

SLOPE: 14(2-30)%

ASPECT: SOUTHWESTERLY

SOIL DRAINAGE: RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL 350*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.6 HA/AUM OR
0.16 AUM/AC

E3: Pl/Bearberry-Juniper

(Pinus contorta/Arctostaphylos uva-ursi-Juniperus spp.)

n=5 This community type is similar to the Limber pine-Douglas-fir/Juniper/Bearberry community type previously described, but occurs on slightly richer and better developed soils. Dry site conditions from south exposures or coarse-textured soils are characteristic of this community type (Archibald et al. 1996). The dry site conditions limit the amount of forage this site can produce and the steep slope limits access to livestock. As a result, this community type would be considered non-use.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LIMBER PINE *(Pinus flexilis)*	1	0-5	17
DOUGLAS-FIR *(Pseudotsuga menziesii)*	1	0-10	25
LODGEPOLE PINE *(Pinus contorta)*	44	3-70	100
SHRUBS			
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	3	0-30	25
JUNIPER *(Juniperus spp.)*	6	0-31	75
SASKATOON *(Amelanchier alnifolia)*	1	0-2	33
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-2	16
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	2	0-16	50
FORBS			
NODDING ONION *(Allium cernuum)*	1	0-2	25
CUT-LEAVED ANEMONE *(Anemone multifida)*	1	0-2	33
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-11	75
YELLOW HEDYSARUM *(Hedysarum sulphurescens)*	1	0-9	25
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	1	0-6	42
SEDGE *(Carex spp.)*	2	0-9	33
PINEGRASS *(Calamagrostis rubescens)*	15	0-38	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC TO MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION RANGE:
1700(1460-2010) M

ASPECT: SOUTH TO WEST

SLOPE:
52(14-80)% (steep slopes and hill crests)

SOIL DRAINAGE: RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	97(0-292)
FORB	150(0-276)
SHRUB	350(160-722)
TOTAL	597(160-998)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
3.0 (1.82-11) HA/AUM OR
0.12 (0.2-<0.04) AUM/AC

E4: Sw-Pl/Alder/Bearberry

(Picea glauca-Pinus contorta/Alnus crispa/Arctostaphylos uva-ursi)

n=1 This community was described by Corns and Achuff (1982) in the Banff and Jasper Mountain ecodistricts. It occupies rapidly drained, level areas with a poor nutrient regime. This community is similar to Archibald et al's. (1996) bearberry Aw-Sw-Pl ecosite phase. Succession will generally be to white spruce, but succession rates will be slow because of the dry site conditions. The presence of green alder indicates there is a higher moisture content at some point in the growing season, making this community type slightly moister than the modal bearberry ecosite. The high tree cover and poor nutrient status would limit the amount of forage for domestic livestock. This community would be rated non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	10	-	100
WHITE SPRUCE *(Picea glauca)*	32	-	100
ASPEN *(Populus tremuloides)*	12	-	100
SHRUBS			
GROUND JUNIPER *(Juniperus communis)*	12	-	100
GREEN ALDER *(Alnus crispa)*	82	-	100
SASKATOON *(Amelanchier alnifolia)*	32	-	100
BUFFALOBERRY *(Shepherdia canadensis)*	30	-	100
TALL BILBERRY *(Vaccinium caespitosum)*	22	-	100
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	12	-	100
TWIN FLOWER *(Linnaea borealis)*	2	-	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	30	-	100
TIMOTHY *(Phleum pratense)*	20	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE : 1360 M

SOIL DRAINAGE: RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL 850*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.1 HA/AUM OR
0.2 AUM/AC

E5: Pl/Buffaloberry/Pinegrass

(Pinus contorta/Shepherdia canadensis/Calamagrostis rubescens)

n=4 This community type occurs on submesic, well drained, south and west-facing slopes. It is situated in slightly lower slope positions and therefore has better developed soils than the Limber pine and bearberry-dominated community types previously described. Archibald et al. (1996) described this community type as being part of the Canada buffaloberry-hairy wildrye ecosite. They felt this ecosite to be relatively dry for the subregion, but not as dry as the limber pine and bearberry ecosites. This community type has only sparse understory vegetation and therefore has only limited forage for domestic livestock. It should be rated as non-use.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	52	35-71	100
ASPEN *(Populus tremuloides)*	1	0-5	25
SHRUBS			
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	19	3-35	100
SHINING WILLOW *(Salix lucida)*	3	0-11	25
PRICKLY ROSE *(Rosa acicularis)*	1	0-2	25
FORBS			
STRAWBERRY *(Fragaria virginiana)*	4	1-13	100
SHOWY ASTER *(Aster conspicuus)*	11	0-30	75
HEART-LEAVED ARNICA *(Arnica cordifolia)*	5	0-15	75
FIREWEED *(Epilobium angustifolium)*	2	0-6	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	15	0-36	75
HAIRY WILD RYE *(Elymus innovatus)*	23	0-40	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC TO MESIC

NUTRIENT REGIME: SUBMESOTROPHIC

ELEVATION:
1544(1502-1580)M

ASPECT: SOUTHERLY

SLOPE: 17(5-30)%

SOIL DRAINAGE: RAPIDLY TO MODERATELY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	840
FORB	282
SHRUB	50
TOTAL	1172

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
1.6 HA/AUM OR
0.25 AUM/AC

E6: Fd/Hairy wildrye
(Pseudotsuga menziesii/Elymus innovatus)

n=11 This community type occurs on steep, dry sites throughout the subregion. Douglas fir is usually restricted to steep, south facing slopes, shallow rocky soils and coarse-textured outwash in valley bottoms (Strong 1992). The soils of this type are not as rich as the previously described Pl/Buffaloberry, but are better than the bearberry and limber pine dominated ecosites. This community has a high cover of Douglas fir and a very sparse understory. Consquently, there is little forage available for domestic livestock. As a result, this community type would be rated as non-use.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	3	0-20	18
DOUGLAS FIR *(Pseudotsuga menziesii)*	53	20-80	100
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	5	1-24	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	5	0-19	73
COMMON JUNIPER *(Juniperus communis)*	1	0-15	9
FORBS			
SHOWY ASTER *(Aster conspicuus)*	4	0-15	82
VEINY MEADOW RUE *(Thalictrum venulosum)*	1	0-4	18
STRAWBERRY *(Fragaria virginiana)*	3	0-8	91
HEART-LEAVED ARNICA *(Arnica cordifolia)*	4	0-23	46
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	0-2	64
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	7	0-15	91
PINEGRASS *(Calamagrostis rubescens)*	3	0-13	73

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC-MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1565(1432-1765) M

ASPECT: VARIABLE

SLOPE: 13(3-45)%

SOIL DRAINAGE:
WELL TO RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	212(0-498)
FORB	168(12-398)
SHRUB	61(0-564)
TOTAL	441(58-896)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
4.1 (2-10) HA/AUM OR
0.1 (0.2-<0.04) AUM/AC

E6a: Fd/Needle litter

(Pseudotsuga menziesii)

n=1 This community type represents a mature Douglas fir forest. The closed canopy of Douglas fir limits the light reaching the forest floor restricting the growth of the understory vegetation. Consequently there is little forage available for domestic livestock and this community type would be rated as non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR (*Pseudotsuga menziesii*)	35	-	100
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	2	-	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	-	100
FORBS			
LOW GOLDENROD *(Solodago missourensis)*	4	-	100
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	3	-	100
STRAWBERRY *(Fragaria virginiana)*	2	-	100
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	1	-	100
THREE FLOWERED AVENS *(Geum triflorum)*	1	-	100
AMERICAN VETCH *(Vicia americana)*	1	-	100
GRASSES			
RICHARDSON'S NEEDLEGRASS *(Stipa richardsonii)*	8	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	7	-	100
PARRY'S OATGRASS *(Danthonia parryi)*	3	-	100
ROUGH FESCUE *(Festuca scabrella)*	2	-	100
IDAHO FESCUE *(Festuca idahoensis)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC-SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1570(1493-1649) M

ASPECT:
SOUTH

SLOPE:
20%

SOIL DRAINAGE:
WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	330(0-660)
FORB	33(0-66)
SHRUB	68(22-114)
TOTAL	431(114-748)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
4.2 (2-10) HA/AUM OR
0.1 (0.2-<0.04) AUM/AC

E6b: Fd/Timothy

(Pseudotsuga menziesii/Phleum pratense)

n=1 This community type was described on a hill crest and represents a Douglas fir/Rough fescue dominated community type that has been extensively utilized by livestock. Livestock often congregate in these open Douglas fir stands on the hilltops. These sites are often windy, cool and the livestock can escape from the bugs. The heavy use on these sites favours the growth of timothy over the native grass species. These sites are quite productive and should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	1	-	100
DOUGLAS FIR			
(Pseudotsuga menziesii)	30	-	100
FORBS			
SPARROW'S EGG LADY'S SLIPPER			
(Cypripedium paserinum)	3	-	100
VEINY MEADOW RUE			
(Thalictrum venulosum)	2	-	100
CANADA THISTLE			
(Cirsium arvense)	1	-	100
NORTHERN BEDSTRAW			
(Galium boreal)	1	-	100
LOW GOLDENROD			
(Solodago missourensis)	T	-	100
GRASSES			
TIMOTHY			
(Phleum pratense)	24	-	100
BLUE JOINT			
(Calamagrostis canadensis)	2	-	100
JUNE GRASS			
(Koeleria macrantha)	5	-	100
BLUE BUNCH WHEATGRASS			
(Agropyron spicatum)	5	-	100
HAIRY WILD RYE			
(Elymus innovatus)	2	-	100
AWNLESS BROME			
(Bromus inermis)	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1619 M

ASPECT: SOUTH

SLOPE: 2%

SOIL DRAINAGE:
MODERATELY WELL

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION (KG/HA)

GRASS	984
FORB	172
TOTAL	1156

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.6 HA/AUM OR 0.25 AUM/AC

E7: Pl/Low bilberry/Hairy wildrye

(Pinus contorta/Vaccinium cespitosum/Elymus innovatus)

n=1 This community is typical of the pine dominated community types adjacent to the grasslands within the Ya Ha Tinda area. They tend to be dry sites, that are well drained with poor to medium nutrient regimes. Forage production on these sites tends to be low because of the closed canopy cover. Succession in the absence of disturbance will be to white spruce.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	37	-	100
WHITE SPRUCE (*Picea glauca*)	5	-	100
SHRUBS			
LOW BILBERRY *(Vaccinium cespitosum)*	13	-	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	5	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	1	-	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	-	100
CUT LEAVED ANEMONE *(Anemone multifida)*	1	-	100
ALPINE HEDYSARUM *(Hedysarum alpinum)*	1	-	100
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	4	-	100
ROUGH FESCUE (*Festuca scabrella*)	3	-	100
LICHEN	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC-MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1600 M

ASPECT:
VARIABLE

SOIL DRAINAGE:
RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	108
FORB	32
SHRUB	50
TOTAL	190

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
9.0 HA/AUM OR <0.04 AUM/AC

E8: Pl/White meadowsweet

(Pinus contorta/Spiraea betulifolia)

n=6 This community is one of several community types which represent the mesic/medium ecosite for the Montane subregion. These sites can be dominated by Douglas fir, white spruce, aspen or lodgepole pine. The understory can be dominated by white meadowsweet, pinegrass or feather moss depending on the successional status of the stand. In the vicinity of the Crowsnest Pass creeping mahonia is also common on these sites (Archibald et al. 1996). White meadowsweet is well adapted to growing on dry rocky slopes (MacKinnon et al. 1992). The presence of a high cover of white meadowsweet may indicate slightly drier conditions and shallower soils than a community dominated by pinegrass. This community type produces little forage for domestic livestock and should be considered non-use.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	54	34-80	100
ENGELMANN SPRUCE *(Picea engelmannii)*	4	0-23	17
SHRUBS			
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	1	0-5	33
GROUND JUNIPER *(Juniperus communis)*	1	0-4	17
WHITE MEADOWSWEET *(Spiraea betulifolia)*	18	7-26	100
THIMBLEBERRY *(Rubus parviflora)*	8	0-35	67
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	4	0-13	83
HEART-LEAVED ARNICA *(Arnica cordifolia)*	4	1-8	100
SHOWY ASTER *(Aster conspicuus)*	3	0-11	33
TALL BILBERRY *(Vaccinium membranaceum)*	9	0-35	33
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	T	0-2	17
PINEGRASS *(Calamagrostis rubescens)*	10	0-35	67
MOSS SPP.	3	0-15	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE:
1602(1460-1768) M

ASPECT:
SOUTH TO SOUTHWEST

SLOPE: 24(2-53)%

SOIL DRAINAGE: WELL TO RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	156(48-306)
FORB	202(36-434)
SHRUB	270(92-408)
TOTAL	628(434-1006)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.9(1.8-4.2)HA/AUM
0.15(0.1-0.23)AUM/AC

E9: Pl/Pinegrass

(Pinus contorta/Calamagrostis rubescens)

n=15 This community is dominated by a lodgepole pine overstory and an understory of pinegrass. Succession will be to white spruce or Douglas fir, but the extensive fire and disturbance history in the Montane has resulted in a predominance of lodgepole pine and Douglas fir (Archibald et al. 1996). This community is also very similar to the previously described Pl/White meadowsweet community type, but the high cover of pinegrass and low cover of white meadowsweet may indicate slightly moister, better developed soils. Pinegrass is generally unpalatable to livestock, but if it is grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is quite low. As a result, this community should be rated as secondary or non-use.

PLANT COMPOSITION — CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	52	35-70	100
WHITE SPRUCE *(Picea glauca)*	6	0-30	62
SHRUBS			
ROSE *(Rosa acicularis)*	4	0-13	80
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	0-5	47
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	1	0-7	13
SNOWBERRY *(Symphoricarpos occidentalis)*	1	0-7	13
FORBS			
SHOWY ASTER *(Aster conspicuus)*	4	0-10	67
HEART-LEAVED ARNICA *(Arnica cordifolia)*	5	0-20	67
TWINFLOWER (*Linnaea borealis*)	16	0-50	80
STRAWBERRY (*Fragaria virginiana*)	8	0-36	93
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	8	0-42	60
PINEGRASS *(Calamagrostis rubescens)*	14	0-34	93
KEELED BROME *(Bromus carinatus)*	4	0-28	20

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION: 1572(1432-1710)M

SOIL DRAINAGE: WELL TO RAPIDLY

ASPECT: SOUTHERLY

SLOPE: 14(2-30)%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	253(80-584)
FORB	180(0-586)
SHRUB	86(0-182)
TOTAL	518(266-916)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
3.5 (2.0-6.8) HA/AUM
0.13(0.2-<0.04) AUM/AC

E10: Sw-Fd/White meadowsweet

(Picea glauca-Pseudotsuga menziesii/Spiraea betulifolia)

n=4 This community type is successional more advanced than the Pl/White meadowsweet and Pl/Pinegrass community types previously described. Archibald et al. (1996) described the successional changes from pine to white spruce and douglas fir on these mesic/medium sites. As succession occurs there is less light reaching the forest floor and understory vegetation becomes very sparse. As a result, there is little forage for domestic livestock underneath these forested stands. This community type would be rated as non-use.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	34	25-60	100
DOUGLAS FIR *(Pseudotsuga menziesii)*	30	10-40	100
LODGEPOLE PINE *(Pinus contorta)*	4	0-10	50
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-5	50
THIMBLEBERRY *(Rubus parviflorus)*	3	0-8	50
TWIN FLOWER *(Linnaea borealis)*	3	0-9	50
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	1	0-1	50
SHOWY ASTER *(Aster conspicuus)*	1	0-3	75
FIREWEED *(Epilobium angustifolium)*	1	0-1	25
WESTERN MEADOW RUE *(Thalictrum occidentale)*	5	6-12	50
FALSE SOLOMON'S SEAL *(Smilacina racemosa)*	1	0-3	50
HEART-LEAVED ARNICA *(Arnica cordifolia)*	3	0-8	50
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	1	0-4	50
PINEGRASS *(Calamagrostis rubescens)*	4	0-7	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION:1556(1487-1600)M

ASPECT: VARIABLE

SLOPE: 23(14-35)%

SOIL DRAINAGE: WELL TO RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	149(20-366)
FORB	106(42-154)
SHRUB	79(0-166)
TOTAL	333(222-480)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
5.4(3.8-8) HA/AUM
0.07(.05-0.1) AUM/AC

E10a: Fd/Snowberry

(Pseudotsuga menziesii/Symphoricarpos occidentalis)

n=5 This community type was described on moderate south and westerly facing slopes on the east side of the Porcupine Hills. Snowberry is generally indicative of nutrient rich seepage areas in the Montane subregion and generally forms thickets in the lower slope positions. The snowberry in this community type consists of small individual plants that are uniformly scattered throughout the community. Archibald et al. (1996) did not recognize this community type and placed it within the hairy wildrye (submesic/medium) ecosite because of the moderate slopes the community was described on. However, the high constancy of snowberry in this community type appears to indicate slightly higher moisture and nutrients. Consequently, this community type was placed within the mesic/medium ecosite. Livestock may use these community types because of the open nature of the tree canopy, but the forage production is only moderate and the areas where this community type were described are generally inaccessible to livestock. As a result this community type should be rated as non-use range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	40	25-55	100
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-14	40
SNOWBERRY *(Symphoricarpos occidentale)*	12	7-18	100
PRICKLY ROSE *(Rosa acicularis)*	3	1-8	100
PIN CHERRY *(Prunus pensylvanica)*	1	0-3	40
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	2	1-3	100
SMOOTH ASTER *(Aster laevis)*	1	0-1	60
BALSAMROOT *(Balsamorhiza sagittata)*	2	0-8	20
WESTERN MEADOW RUE *(Thalictrum occidentale)*	1	0-4	20
AMERICAN VETCH *(Vicia americana)*	1	1-2	100
STAR-FLOWERED SOLOMON'S-SEAL *(Smilacina stellata)*	1	0-2	80
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-12	80
GREEN NEEDLE GRASS *(Stipa viridula)*	2	0-4	60
SEDGE *(Carex spp.)*	3	1-5	80
PARRY'S OATGRASS *(Danthonia parryi)*	4	0-10	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION: 1463 (1372-1524)M

ASPECT: VARIABLE

SLOPE: 16(5-35)%

SOIL DRAINAGE: WELL TO RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	267(112-442)
FORB	227(0-408)
SHRUB	122(0-184)
TOTAL	615(112-898)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.9(1.6-2.0) HA/AUM
0.12(<0.04-0.2) AUM/AC

E11: Pl/Moss

(Pinus contorta/Moss spp.)

n=6 This community type is similar to the previously described Pl/Pinegrass and Pl/White meadowsweet communities, but represents further succession. This community was described on moister sites, which probably escaped fire and disturbance, allowing succession to occur. Continued succession in the absence of disturbance will likely be to the Sw/Moss dominated community type. This community type is moderately productive for domestic livestock. The higher moisture conditions favour the growth of fireweed and aster spp. These species are moderately palatable to livestock. This community type would be rated as secondary range for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	4	0-19	50
LODGEPOLE PINE *(Pinus contorta)*	42	13-69	100
SHRUBS			
WILLOW *(Salix spp.)*	2	0-5	67
WHITE MEADOWSWEET *(Spiraea betulifolia)*	T	0-1	50
BUFFALOBERRY *(Shepherdia canadensis)*	2	0-5	50
FORBS			
STRAWBERRY *(Fragaria virginiana)*	21	13-28	100
FIREWEED *(Epilobium angustifolium)*	10	1-19	100
LINDLEY'S ASTER *(Aster ciliolatus)*	16	5-22	100
DANDELION *(Taraxacum officinale)*	6	1-17	100
WESTERN MEADOW RUE *(Thalictrum occidentale)*	3	0-6	83
GRASSES			
SEDGE *(Carex spp.)*	11	4-20	100
VIRGINIA WILDRYE *(Elymus virginicus)*	8	2-14	100
MOSS	46	12-65	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO HYGRIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1742 (1707-1798)M

ASPECT: NORTHERLY

SLOPE: 1%

DRAINAGE: MODERATELY WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	243(0-570)
FORB	433(0-832)
SHRUB	30(0-96)
TOTAL	706(136-1402)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 (1.3-13.0) HA/AUM
0.15(<0.04-0.3) AUM/AC

E12: Sw/Moss

(Picea glauca/Moss spp.)

n=14 This community type is similar to the previously described Sw-Fd/White meadowsweet community, but represents further succession. This community was described on northerly aspects, which probably escaped fire and disturbance, allowing succession to occur. Note as succession occurs there is a corresponding drop in forage productivity from 500-600 kg/ha in the Pl community types to 201 kg/ha in this community type. This community type would be rated as non-use for domestic livestock.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	63	10-90	100
ASPEN *(Populus tremuloides)*	3	0-20	34
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	2	0-4	75
SNOWBERRY *(Symphoricarpos occidentalis)*	2	0-10	50
FORBS			
HEART-LEAVED ARNICA *(Arnica cordifolia)*	4	0-18	36
VEINY MEADOW RUE *(Thalictrum venulosum)*	1	0-3	43
SHOWY ASTER *(Aster conspicuus)*	1	0-5	29
TWINFLOWER *(Linnaea borealis)*	4	0-19	36
WINTERGREEN *(Pyrola asarifolia)*	1	0-2	64
GRASSES			
SEDGE *(Carex spp.)*	1	0-10	29
HAIRY WILDRYE *(Elymus innovatus)*	1	0-5	57
MOSS	25	0-78	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: SUBMESOTROPHIC TO MESOTROPHIC

ELEVATION: 1407 (1330-1510)M

ASPECT: NORTHERLY

SLOPE:14(1-35)%

SOIL DRAINAGE: WELL TO RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	60(2-148)
FORB	138(60-246)
SHRUB	3(0-12)
TOTAL	201(66-394)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
9(4.5->10) HA/AUM
<0.04 AUM/AC

E12a: Sw/Horsetail

(Picea glauca/Equisetum arvense)

n=4 This community type represents one of the wettest and most nutrient-rich forest conditions in the Montane. Seepage and high water tables can be expected. Nutrient levels are high resulting in high diversity in shrub and forb layers. Generally, there is little palatable forage for domestic livestock and this community type should be rated as non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	70	69-70	100
BALSAM POPLAR *(Populus balsamifera)*	4	0-10	50
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	2	1-3	100
FORBS			
HORSETAIL *(Equisetum arvense)*	33	20-40	100
RICHARDSON'S GERANIUM *(Geranium richardsonii)*	6	1-10	100
DANDELION *(Taraxacum officinale)*	2	1-3	100
CANADA VIOLET *(Viola canadensis)*	8	0-30	25
GRASSES			
Marsh reedgrass *(Calamagrostis canadensis)*	1	0-3	25
MOSS	25	20-78	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1391(1385-1510)M

ASPECT: NORTHERLY

SLOPE:14(1-35)%

SOIL DRAINAGE: WELL TO RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	28
FORB	332
SHRUB	124
TOTAL	484

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
3.8 HA/AUM OR 0.1 AUM/AC

E12b: Sw/Silverberry/Horsetail

(Picea glauca/Elaeagnus commutata/Equisetum arvense)

n=1 This community type was described by Thompson and Hansen (2002) on an old floodplain bar that was 0.5 to 1.0 m above the current water table. The community represents succession to a Sw/Horsetail dominated type. As more sediment is deposited over the gravel it will favour the growth of horsetail over silverberry. Silverberry is common on gravelly river bars, but as the sediment increases and the drainage becomes poorer silverberry will decline in cover. There is little forage available for domestic livestock in this community type and it should be rated as non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	20	-	100
WHITE SPRUCE *(Picea glauca)*	30	-	100
SHRUBS			
SILVERBERRY *(Elaeagnus commutata)*	90	-	100
BEBB WILLOW *(Salix bebbiana)*	10	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	3	-	100
FIELD HORSETAIL *(Equisetum arvense)*	40	-	100
GRASSES			
BALTIC RUSH *(Juncus balticus)*	20	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1231 M

SLOPE: 0%

ASPECT: VARIABLE

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	100
FORB	401
SHRUB	52
TOTAL	553 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
3.3 HA/AUM OR 0.12 AUM/AC

E13: Pl/Thimbleberry

(Pinus contorta/Rubus parviflorus)

n=5 Nutrient rich seepage occurs on this community type at some point in the growing season favouring the growth of thimbleberry. On these sites thimbleberry is very common south of the Crowsnest Pass and is generally replaced by cow parsnip north of the Pass. Succession on these sites will be from aspen to pine and then to white spruce. Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Thimbleberry is generally unpalatable to livestock, but if the site has an abundance of cow parsnip it may be extensively utilized. This community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	48	20-65	100
WHITE SPRUCE			
(Picea glauca)	2	0-10	20
SHRUBS			
THIMBLEBERRY			
(Rubus parviflorus)	32	5-55	100
WHITE MEADOWSWEET			
(Spiraea betulifolia)	9	1-14	100
FORBS			
HEART-LEAVED ARNICA			
(Arnica cordifolia)	5	4-6	100
LINDLEY'S ASTER			
(Aster ciliolatus)	2	1-7	100
STRAWBERRY			
(Fragaria virginiana)	2	1-4	100
FIELD HORSETAIL			
(Equisetum arvense)	6	0-15	40
COW PARSNIP			
(Heracleum lanatum)	3	0-6	40
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	4	0-12	60
BROME			
(Bromus vulgaris)	3	0-6	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION:1588 (1478-1680) M

SLOPE: 18(7-37)%

ASPECT: VARIABLE

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	320(40-1132)
FORB	460(142-1152)
SHRUB	191(0-616)
TOTAL	976(398-1346)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.9(1.4-4.6) HA/AUM
0.21(.07-0.3) AUM/AC

E14: Pl/Thimbleberry/Beargrass

(Pinus contorta/Rubus parviflorus/Xerophyllum tenax)

n=1 This community type is very similar to the Pl/Thimbleberry community type previously described, but contains a high cover of beargrass. Archibald et al. (1996) recognized these beargrass-dominated community types in the extreme southern portion of the subregion. Beargrass is well suited to growing on hillsides and dry subalpine meadows and appears to indicate the transition from the lower Montane subregion to the upper Subalpine subregion. The tender seed pods are often eaten by small rodents and elk. In the winter Mountain goats often eat the leaves (Craighead et al. 1963). The tough leaves of beargrass are unpalatable to livestock.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	45	-	100
WHITE SPRUCE *(Picea glauca)*	3	-	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	34	-	100
WILLOW (*Salix spp.*)	19	-	100
WHITE MEADOWSWEET (*Spiraea betulifolia*)	17	-	100
FORBS			
BEARGRASS *(Xerophyllum tenax)*	54	-	100
GROUSEBERRY *(Vaccinium scoparium)*	23	-	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	9	-	100
EARLY BLUE VIOLET *(Viola adunca)*	3	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	9	-	100
GRASSES			
BROME *(Bromus vulgaris)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1494 M

SLOPE: 15%

ASPECT: SOUTHWEST

SOIL DRAINAGE: RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	80
FORB	856
SHRUB	1010
TOTAL	1946

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
1.9 HA/AUM OR 0.2 AUM/AC

E15: Pl/River alder-Thimbleberry

(Pinus contorta/Alnus tenuifolia-Rubus parviflorus)

n=1 This community type is very similar to the previously described Pl/Thimbleberry and Pl/Thimbleberry/Beargrass community types, but contains river alder. River alder tends to be found growing on nutrient seepage areas with high water tables. This community type is probably moister than the other Pl/Thimbleberry dominated types, but dries out at some time during the growing season which favours the growth of thimbleberry. The high cover of alder limits the light reaching the forest floor and results in low production of grass and forbs. The majority of the total production comes from alder which is unpalatable and generally inaccessible to livestock. Consequently, this community type would be rated as non-use.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	1	-	100
LODGEPOLE PINE *(Pinus contorta)*	10	-	100
SHRUBS			
RIVER ALDER *(Alnus tenuifolia)*	30	-	100
THIMBLEBERRY *(Rubus parviflorus)*	15	-	100
GREEN ALDER *(Alnus crispa)*	10	-	100
ROSE *(Rosa acicularis)*	10	-	100
FORBS			
DEWBERRY *(Rubus pubescens)*	10	-	100
FIELD HORSETAIL *(Equisetum arvense)*	5	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	1	-	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	2	-	100
HAIRY WILDRYE *(Elymus innovatus)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME : PERMESOTROPHIC

ELEVATION: 1300 M

SLOPE: 12%

ASPECT: NORTH

SOIL DRAINAGE: MODERATELY WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL 800 KG/HA*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.3 HA/AUM OR 0.17 AUM/AC

E16: Sw/Thimbleberry
(Picea glauca/Rubus parviflorus)

n=1 This community type is very similar to the Pl/Thimbleberry dominated community types previously described, but is successionally more advanced. Succession on the thimbleberry dominated ecosites will be from aspen to pine and then to white spruce (Archibald et al. 1996). The northerly aspect of this particular community type has allowed the site to escape disturbance by fire and succession has occurred to white spruce. Note as succession occurs there is a corresponding drop in forage productivity from 500-600 kg/ha in the Pl community types to 250 kg/ha in this community type. This community type would be rated as non-use for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	75	-	100
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	1	-	100
THIMBLEBERRY *(Rubus parviflorus)*	11	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	-	100
FORBS			
SHOWY ASTER *(Aster conspicuus)*	1	-	100
TWINFLOWER *(Linnaea borealis)*	4	-	100
HEART-LEAVED ARNICA *(Arnica cordifolia)*	2	-	100
MOSSES	68	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION:1570M

SLOPE:10%

ASPECT: NORTH

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	18
FORB	130
SHRUB	100
TOTAL	248

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
7.3 HA/AUM OR <0.04 AUM/AC

E17: Sb-Lt/Labrador tea
(Picea mariana-Larix laricina/Ledum groenlandicum)

n=1 This community type occurs in association with lowland boggy areas. The water table under this type has begun to drop which has allowed succession toward a white spruce-dominated community. Generally, black spruce-larch dominated communities are considered successionally mature because of poor drainage, acidic soils and low soil nutrients which prevent succession to white spruce. This community type is likely flooded in the spring, therefore, it may provide a scource of water for livestock early in the year. However, due to poor access and the limited number of palatable plants available, this community type would be considered non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	20	-	100
WHITE SPRUCE *(Picea glauca)*	20	-	100
LARCH *(Larix laricina)*	5	-	100
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	10	-	100
MYRTLE-LEAVED WILLOW *(Salix myrtillifolia)*	10	-	100
FORBS			
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	5	-	100
TWINFLOWER *(Linnaea borealis)*	5	-	100
DWARF SCOURING RUSH *(Equisetum scirpoides)*	4	-	100
COMMON HORSETAIL *(Equisetum arvense)*	3	-	100
NORTHERN COMANDRA *(Geocaulon lividum)*	2	-	100
GRASSES			
SHEATHED SEDGE *(Carex vaginata)*	15	-	100
HAIRY WILDRYE (*Elymus innovatus*)	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME : SUBMESOTROPHIC

ELEVATION: 1220 M

SOIL DRAINAGE: POORLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL 500 KG/HA*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
3.6 HA/AUM OR 0.12 AUM/AC

E18: Se/Grouseberry/Moss

(Picea engelmannii/Vaccinium scoparium/Moss)

n=1 This community represents a subalpine forested community type with mesic moisture regimes and medium nutrient regimes. Subaipine fir, Englemann spruce, false azalea and grouseberry rarely occur at lower elevations and therefore are characteristic of the subalpine environment. The Castle area of the province is unusual in that the subalpine forested communities can be found at lower montane elevations and the montane grasslands can be found at alpine and subalpine elevations. Clearly there is a strong overlap between the Montane and Subalpine subregions of this area of the province. It is for this reason that the forested community types for the Castle area are described in this guide.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ENGELMANN SPRUCE *(Picea engelmannii)*	26	-	100
WHITE SPRUCE *(Picea glauca)*	21	-	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	3	-	100
FALSE AZALEA *(Menziesia ferruginea)*	3	-	100
GROUSEBERRY *(Vaccinium scoparium)*	15	-	100
FORBS			
FIREWEED *(Epilobium angustifolium)*	17	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	67	-	100
YELLOW BEARDTONGUE *(Penstemon confertus)*	5	-	100
SMOOTH ASTER *(Aster laevis)*	1	-	100
GRASSES			
NORTHERN REEDGRASS *(Calamagrostis inexpansa)*	23	-	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	-	100
MOSS	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1530 M

ASPECT: EAST

SLOPE: 10%

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	430
FORB	484
SHRUB	156
TOTAL	1064

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.0 HA/AUM OR 0.2 AUM/AC

E19. Se/Moss
(Picea engelmannii/Moss)

n=3 This community type is very similar to the previously described Se/Grouseberry community type, but lacks the cover of grouseberry. Grouseberry is well adapted to growing at higher elevations in the subalpine and is very common at timberline between the subalpine and alpine environments (Willoughby 1999). The lack of grouseberry in this community type may indicate warmer sites than the previously described Se/Grouseberry community. This community would be rated as non-use for domestic livestock.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ENGELMANN SPRUCE *(Picea engelmannii)*	57	43-66	100
BALSAM POPLAR *(Populus balsamifera)*	11	0-33	33
SUBALPINE FIR (*Abies lasiocarpa*)	5	0-15	33
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	5	0-8	67
SNOWBERRY *(Symphoricarpos occidentalis)*	15	0-42	67
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-3	67
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	5		
WILD STRAWBERRY *(Fragaria virginiana)*	1	0-3	67
HEART-LEAVED ARNICA *(Arnica cordifolia)*	10	0-29	67
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	1-1	100
SHOWY ASTER *(Aster conspicuus)*	4	0-11	67
BUNCHBERRY *(Cornus canadensis)*	5	0-14	33
GRASSES			
TALL TRISETUM *(Trisetum canescens)*	3	0-9	33
MOSSES	18	2-44	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1561(1433-1798)M

SLOPE: 21(5-37)%

ASPECT: VARIABLE

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	60(28-82)
FORB	212(56-356)
SHRUB	62(0-108)
TOTAL	334(162-546)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
5.4(1.1-3.3) HA/AUM
<0.04 AUM/AC

E20:Fa-Pl-Sw/White meadowsweet/Pinegrass

(Abies lasiocarpa-Pinus contorta-Picea glauca/Spiraea betulifolia/Calamagrostis rubescens)

n=12 This community is indicative of the overlap between the Subalpine and Montane subregions of the Castle area. The overstory is dominated by subalpine fir a species characteristic of the subalpine environment, but the understory is dominated by white meadowsweet and pinegrass species characteristic of the montane environment. This community type occupies submesic to mesic sites, on moderate slopes with variable aspects. Forage productivity is moderate averaging 1200 kg/ha, but the majority of the understory vegetation is unpalatable. As a result this community should be only rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
SUBALPINE FIR *(Abies lasiocarpa)*	33	0-70	92
WHITE SPRUCE (*Picea glauca*)	25	3-50	100
LODGEPOLE PINE (*Pinus contorta*)	20	0-75	83
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	7	0-30	92
WHITE MEADOWSWEET *(Spiraea betulifolia)*	6	0-25	83
THIMBLEBERRY *(Rubus parviflora)*	2	0-11	50
FALSE AZALEA *(Menziesii ferruginea)*	3	0-14	33
FORBS			
FIREWEED *(Epilobium angustifolium)*	3	0-9	83
WESTERN MEADOW RUE *(Thalictrum occidentale)*	2	0-4	83
WILD STRAWBERRY *(Fragaria virginiana)*	16	0-40	83
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	0-6	75
SHOWY ASTER *(Aster conspicuus)*	2	0-6	67
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	14	0-41	83
SEDGE *(Carex spp.)*	2	0-10	42

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBMESIC

NUTRIENT REGIME : MESOTROPHIC

ELEVATION: 1592 (1493-1981)M

SLOPE: 14(3-40)%

ASPECT: VARIABLE

SOIL DRAINAGE: RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	845(78-4100)
FORB	537(152-910)
SHRUB	177(0-682)
TOTAL	1480(462-4482)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (0.4-3.9)HA/AUM
0.33(0.1-1.0) AUM/AC

E21: Fa-Se/Heart-leaved arnica
(Abies lasiocarpa-Picea engelmannii/Arnica cordifolia)

n=3 This community type is very similar to the Se/Moss community previously described, but contains a high cover of subalpine fir. Succession in the subalpine is from lodgepole pine to Engelmann spruce and subalpine fir (Archibald et al. 1996). This community type appears to represent the climatic climax for sites with subalpine environments in the Castle area of the province. The northerly aspects of the three described sites probably allowed them to escape the recent fire history and undergo succession. As these forested sites succeed towards climax there is very little light reaching the forest floor. As a result, there is little forage for domestic livestock and this community would be rated as non-use

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
SUBALPINE FIR *(Abies lasiocarpa)*	55	25-80	100
ENGELMANN SPRUCE *(Picea engelmannii)*	21	15-30	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	2	0-4	33
FALSE AZALEA *(Menziesia ferruginea)*	23	0-65	67
GREEN ALDER *(Alnus crispa)*	11	0-33	33
FORBS			
HEART- LEAVED ARNICA *(Arnica cordifolia)*	24	20-27	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	3		
ONE FLOWERED WINTERGREEN *(Moneses uniflora)*	2	0-2	67
SUGARSCOOP *(Tiarella unifoliata)*	2	0-3	67
GRASSES			
SEDGE *(Carex spp.)*	2	0-3	67
MOSSES	10	0-22	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME : MESOTROPHIC

ELEVATION: 1760(1740-1788)M

SLOPE: 25(21-30)%

ASPECT: NORTHERLY

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	16(0-48)
FORB	153(0-356)
SHRUB	239(0-718)
TOTAL	408(48-1074)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4.5(1.7->10) HA/AUM
0.1(<0.04-0.25) AUM/AC

E22: Se/Clover-Oxeye daisy

(Picea engelmannii/Trifolium repens-Chrysanthemum leucanthemum)

n=1 This community type represents a forested community type that has been heavily utilized by livestock. The heavy utilization has allowed clover and oxeye daisy to invade into the understory. Once established oxeye daisy is very invasive and difficult to control. The authors have seen whole fields taken over by this plant species. This plant is unpalatable to livestock so when invasion occurs there is a corresponding drop in forage production.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
SUBALPINE FIR *(Abies lasiocarpa)*	12	-	100
ENGELMANN SPRUCE *(Picea engelmanii)*	11	-	100
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	7	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	6	-	100
THIMBLEBERRY *(Rubus parviflora)*	4	-	100
FORBS			
OX-EYE DAISY *(Chrysanthemum leucanthemum)*	17	-	100
CLOVER *(Trifolium repens)*	15	-	100
TALL BILBERRY *(Vaccinium myritillus)*	7	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	3	-	100
TWINFLOWER *(Linnaea borealis)*	4	-	100
DANDELION *(Taraxacum offincinale)*	3	-	100
GRASSES			
SEDGE *(Carex spp.)*	4	-	100
PINEGRASS *(Calamagrostis rubescens)*	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1557 M

SLOPE: 9%

ASPECT: EAST

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION (KG/HA)

GRASS	150
FORB	88
SHRUB	366
TOTAL	604

ECOLOGICALLY SUSTAINABLE STOCKING RATE
3.8 HA/AUM OR 0.1 AUM/AC

MONTANE SUBREGION

MIXEDWOOD COMMUNITY TYPES

Photo 9: This represents an Aw-Sw mixedwood community type. There is a good forage base under the aspen, however as the spruce cover increases productivity will decline.

Key to Mixedwood community type

1. Communities dominated by subalpine species such as Engelmann spruce, and subalpine fir........ **2**
Communities do not have subalpine species, instead are dominated by Lodgepole pine, White spruces, and Douglasfir... **4**

2. Community is grazed as indicated by the presence of Timothy, Dandelion, Clover, Canada thistle, and Kentucky bluegrass...**Aw-Fa-Se/Timothy** f10
Snowberry dominates the understory... **3**

3. Subalpine fir dominates the overstory, and snowberry and Pinegrass dominate the understorey....... ....**Aw-Fa/Snowberry/Pinegrass** f8
Englemann spruce dominates the overstory. Sites are on moist north facing slopes at lower slope positions where seepage occurs in Spring and after heavy rainfalls................**Spruce-Pb/Snowberry** f11

4. Aspen, Balsam poplar, Lodgepole pine and White spruce dominated communities..................... **5**
Aspen and Douglas fir dominated communities.. **13**

5. Moist sites containing Balsam poplar... **6**
Drier sites dominated by Aspen, Lodgepole pine, and White spruce.. **7**

6. Site found in moist, lower slope positions where seepage occurs in the spring or after heavy rainfall. Snowberry dominates the understory..**Spruce-Pb/Snowberry** f11
Site found in moist, lower slope positions where seepage occurs in the spring or after heavy rainfall. Pinegrass dominates the understory...**Aw-Pb-Sw/Pinegrass** f7

7. Snowberry dominates the understory. Sites are mesic with medium nutrient regimes............ ....**Pl-Aw/Snowberry/Kentucky bluegrass** f9
Dwarf scouring rush, Blueberry, Yellow mountain avens, Pinegrass, Marsh reedgrass, or Buffaloberry, Hairy wildrye dominate the understory.. **8**

8. Dwarf scouring rush dominates the understory. Site occurs at moist, nutrient rich, lower slope positions, representing the wettest and most rich conditions in the Montane subregion...**Sw-Aw/Scouring rush** f12
Blueberry, Yellow mountain avens, Pinegrass, Marsh reedgrass, or Buffaloberry, Hairy wildrye dominate the understory.. **9**

9. Blueberry dominates the understorey...**Aw-Sw/blueberry** f5
Yellow mountain avens, Pinegrass, Marsh reedgrass, or Buffaloberry, Hairy wildrye dominate the understory **10**

10. Yellow mountain avens dominate the understory (gravelly river and creek flood plains)............... ....**Sw-Pl-Pb/Yellow Mtn. avens** f2
Pinegrass, Marsh reedgrass, or Buffaloberry, Hairy wildrye dominate the understory................. **11**

11. Pinegrass dominates the understory...**Aw-Pl/Pinegrass** f4
Marsh reedgrass, or Buffaloberry, Hairy wildrye dominate the understory................................ **12**

12. Marsh reedgrass dominates the understory......................................**Aw-Pl/Marsh reedgrass** f8a
Buffaloberry, Hairy wildrye dominate the understory.........**Aw-Pl/Buffaloberry/Hairy wildrye** f3

13. Moister sites(dominated by white meadowsweet, or pinegrass).. **14**
Drier sites. Dominated by Bearberry...**Aw-Fd/Bearberry** f1

14. White meadowsweet dominates the understory...........................**Aw-Fd/White meadowsweet** f6
Pinegrass dominates the understory..**Fd-Aw/Pinegrass** f4a

F1: Aw-Fd/Bearberry

(Populus tremuloides-Pseudotsuga menziesii/Arctostaphylos uva-ursi)

n=2 This community represents an aspen dominated community type that is undergoing succession to douglas fir. It is part of the bearberry ecosite described by Archibald et al. (1996). This ecosite occupies dry upper slope positions with south exposures and coarse textured soils. Forage production on this site will be low because of the dry site conditions and livestock will have a difficulty accessing the upper slope position. This community should be rated as secondary range

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	28	20-32	100
DOUGLAS-FIR *(Pseudotsuga menziesii)*	22	21-22	100
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	6	3-8	100
CREEPING JUNIPER *(Juniperus horizontalis)*	6	0-12	50
BUFFALOBERRY *(Shepherdia canadensis)*	3	2-3	100
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	48	43-52	100
COMMON YARROW *(Achillea millefolium)*	2	1-3	100
STRAWBERRY *(Fragaria virginiana)*	6	3-9	100
CUT-LEAVED ANEMONE *(Anemone multifida)*	2	1-2	100
GRASSES			
SEDGE *(Carex spp.)*	6	1-9	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	0-3	100
PINEGRASS *(Calamagrostis rubescens)*	6	1-9	100
ROUGH FESCUE *(Festuca scabrella)*	9	1-16	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: SUBMESOTROPHIC-MESOTROPHIC

ELEVATION: 1653(1645-1661) M

SOIL DRAINAGE: RAPIDLY

SLOPE: 12(10-15)%

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	418
FORB	190
TOTAL	608

ECOLOGICALLY SUSTAINABLE STOCKING RATE
3.0 HA/AUM OR 0.15 AUM/AC

F2: Sw-Pl-Pb/Yellow Mtn. avens

(Picea glauca-Pinus contorta-Populus balsamifera/Dryas drummondii)

n=1 This community is typical of dry, gravelly river flats with nutrient poor soils. It is similar to the Yellow Mtn. avens /Junegrass community type previously described, but this community type is successionally more advanced. The poor soil conditions limits the forage productivity and amount of regrowth after grazing. This community type should be rated as non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	39	-	100
LODGEPOLE PINE *(Pinus contorta)*	20	-	100
BALSAM POPLAR *(Populus balsamifera)*	17	-	100
SHRUBS			
BUFFALOBERRY *(Shepherdia canadensis)*	4	-	100
PRICKLY ROSE *(Rosa acicularis)*	1	-	100
FORBS			
YELLOW MTN. AVENS *(Dryas drummondii)*	12	-	100
SHOWY ASTER *(Aster conspicuus)*	7	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	3	-	100
SHOWY LOCOWEED *(Oxytropis splendens)*	2	-	100
GRASSES			
CANADA BLUEGRASS *(Poa compressa)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1547 M

SLOPE: 1%

ASPECT: NORTH

SOIL DRAINAGE: RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	152
FORB	252
SHRUB	40
TOTAL	444

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
4.0 HA/AUM OR 0.1 AUM/AC

F3: Aw-Pl/Buffaloberry/Hairy wildrye

(Populus tremuloides-Pinus contorta/Shepherdia canadensis/Elymus innovatus)

n=1 This community occurs on submesic, well drained, south and west-facing slopes. It is very similar to the Pl/Buffaloberry/Pinegrass community type previously described, but is in an earlier successional stage. The forage productivity on this community is only moderate and should be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	43	-	100
LODGEPOLE PINE *(Pinus contorta)*	21	-	100
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	12	-	100
SASKATOON *(Amelanchier alnifolia)*	1	-	100
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	15	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	9	-	100
CREEPING MAHONIA *(Berberis repens)*	6	-	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	2	-	100
DANDELION *(Taraxacum officinale)*	2	-	100
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	20	-	100
PINEGRASS *(Calamagrostis rubescens)*	14	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1608 M

ASPECT: SOUTH

SLOPE: 7%

SOIL DRAINAGE: RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL 350 KG/HA*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
4.0 HA/AUM OR 0.1 AUM/AC

F4: Aw-Pl/Pinegrass

(Populus tremuloides-Pinus contorta/Calamagrostis rubescens)

n=1 This community type is dominated by an overstory of aspen and lodgepole pine, and represents the mid successional stage between an Aw/Pinegrass and Pl/Pinegrass dominated community type. Pinegrass is generally unpalatable to livestock, but if grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is midway between the aspen dominated community (1278 kg/ha) and the pine dominated community (598 kg/ha). This community would be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	COSNT.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	40	-	100
ASPEN *(Populus tremuloides)*	40	-	100
SHRUBS			
ROSE *(Rosa acicularis)*	2	-	100
FORBS			
TWINFLOWER *(Linnaea borealis)*	25	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	16	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	14	-	100
RICHARDSON'S GERANIUM *(Geranium richardsonii)*	12	-	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	6	-	100
GRASSES			
PINE GRASS *(Calamagrostis rubescens)*	38	-	100
FRINGED BROME *(Bromus ciliatus)*	13	-	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1554 M

SOIL DRAINAGE: MOD.WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	600
FORB	384
TOTAL	984

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.6 HA/AUM OR 0.16 AUM/AC

F4a: Fd-Aw/Pinegrass

(Pseudotsuga menziesii-Populus tremuloides/Calamagrostis rubescens)

n=4 This community type is dominated by an overstory of aspen and Douglas fir, and represents the mid successional stage between an Aw/Pinegrass and Fd dominated community types. Pinegrass is generally unpalatable to livestock, but if grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is midway between the aspen dominated community and the Douglas fir dominated communities . This community would be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	25	20-40	100
ASPEN *(Populus tremuloides)*	31	20-40	100
SHRUBS			
ROSE *(Rosa acicularis)*	4	1-10	100
FORBS			
MOUNTAIN DANDELION *(Agoseris glauca)*	1	0-4	75
WILD STRAWBERRY *(Fragaria virginiana)*	5	3-7	100
AMERICAN VETCH *(Vicia americana)*	1	1-2	100
DANDELION *(Taraxacum officinale)*	2	1-4	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	1-3	100
GRASSES			
PINE GRASS *(Calamagrostis rubescens)*	21	15-28	100
HAIRY WILDRYE *(Elymus innovatus)*	8	0-16	75
SEDGE *(Carex spp.)*	1	0-2	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1562(1433-1646)M

SOIL DRAINAGE: WELL
SLOPE: 5(0-10%)
ASPECT: SOUTHEAST

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	905(662-1268)
FORB	237(98-370)
SHRUB	51(6-132)
TOTAL	1192(1042-1372)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (1.3-1.7)HA/AUM
0.26(0.24-0.31) AUM/AC

F5: Aw-Sw/Blueberry

(Populus tremuloides-Picea glauca/Vaccinium spp.)

n=2 This community represents the mid successional stage of a Sw/Moss dominated community type. The spruce dominated community types usually occupy lower slope positions with northerly aspects. These sites have escaped the recent fire history in the Montane and have succeeded to white spruce the climax species. There is very little growth of forbs and grass in this community type and should be rated as non-use for domestic livestock.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	36	12-40	100
ASPEN *(Populus tremuloides)*	33	30-35	100
SHRUBS			
TALL BILBERRY *(Vaccinium membranaceum)*	6	0-11	50
SNOWBERRY *(Symphoricarpos occidentalis)*	4	0-8	50
FORBS			
WESTERN MEADOW RUE *(Thalictrum occidentale)*	4	0-6	50
WILD STRAWBERRY *(Fragaria virginiana)*	8	6-10	100
AMERICAN VETCH *(Vicia americana)*	1	0-1	50
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-1	50
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	2	100
GRASSES			
PINE GRASS *(Calamagrostis rubescens)*	3	0-5	50
MELIC GRASS *(Melica smithii)*	12	0-24	50
VIRGINIA WILDRYE *(Elymus virginicus)*	5	0-9	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1524 M

ASPECT: NORTHERLY

SLOPE: 2%

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	330
FORB	46
SHRUB	48
TOTAL	424

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
2.6 HA/AUM OR 0.19 AUM/AC

F6: Aw-Fd/White meadowsweet

(Populus tremuloides-Pseudotsuga menziesii/Spiraea betulifolia)

n=1 This community type represents an intermediate stage of succession between the Sw-Fd/White meadowsweet and Aw/White meadowsweet/Pinegrass dominated community types. White meadowsweet is indicative of sites with mesic moisture and medium nutrient regimes (Archibald et al. 1996). When this community succeeds to a conifer dominated type there will be insufficient forage for domestic livestock. Presently, with the high aspen cover there will be a moderate forage base and this community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	40	-	100
ASPEN *(Populus tremuloides)*	36	-	100
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	19	-	100
DWARF BILBERRY *(Vaccinium caespitosum)*	2	-	100
PRICKLY ROSE *(Rosa acicularis)*	1	-	100
FORBS			
SHOWY ASTER *(Aster conspicuus)*	5	-	100
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	2	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	1	-	100
STRAWBERRY *(Fragaria virginiana)*	6	-	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	4	-	100
HAIRY WILD RYE *(Elymus innovatus)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1593 M

ASPECT: SOUTH

SLOPE: 20%

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL 800 KG/HA*

(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.3 HA/AUM OR 0.18 AUM/AC

F7: Aw-Pb-Sw/Pinegrass

(Populus tremuloides-Populus balsamifera-Picea glauca/Calamagrostis rubescens)

n=1 This community type occurs on moist, lower slope positions where seepage occurs in the spring or after heavy rainfall. Succession will be to a spruce dominated forest. The high tree cover limits the light reaching the forest floor. Consequently, only a moderate amount of forage is produced for domestic livestock.

PLANT COMPOSITION	**CANOPY COVER (%)**		
	MEAN	**RANGE**	**CONST**
TREES			
ASPEN			
(Populus tremuloides)	25	-	100
BALSAM POPLAR			
(*Populus balsamifera*)	15	-	100
WHITE SPRUCE			
(*Picea glauca*)	15	-	100
SHRUBS			
ROSE			
(Rosa acicularis)	2	-	100
WHITE MEADOWSWEET			
(Spiraea betulifolia)	4	-	100
FORBS			
WILD WHITE GERANIUM			
(Geranium richardsoni)	11	-	100
VEINY MEADOW RUE			
(Thalictrum venulosum)	5	-	100
STRAWBERRY			
(Fragaria virginiana)	7	-	100
TALL LUNGWORT			
(Mertensia paniculata)	5	-	100
CREAM-COLORED VETCHLING			
(Lathyrus ochroleucus)	1	-	100
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	8	-	100
HAIRY WILDRYE			
(*Elymus innovatus*)	8	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1372 M

ASPECT: WEST

SLOPE: 8%

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	122
FORB	282
SHRUB	28
TOTAL	412

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4.4 HA/AUM OR 0.09 AUM/AC

F8: Aw-Fa/Snowberry/Pinegrass

(Populus tremuloides-Abies lasiocarpa/Symphoricarpos albus/Calamagrostis rubescens)

n=1 This community is very similar to the Fa-Pl-Sw/White meadowsweet/Pinegrass previously described. This community was described in the Castle area and is indicative of the overlap between the Subalpine and Montane subregions. The overstory has a high cover of subalpine fir a species characteristic of the subalpine environment, but the understory is dominated by snowberry and pinegrass species characteristic of the montane environment. The forage productivity of this community type is moderate, but the majority of production is coming from snowberry which is generally unpalatable to livestock. This community should be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST
TREES			
LODGEPOLE PINE *(Pinus contorta)*	6	-	100
ASPEN *(Populus tremuloides)*	48	-	100
SUBALPINE FIR *(Abies lasiocarpa)*	10	-	100
SHRUBS			
SNOWBERRY *(Symphoricarpos albus)*	59	-	100
SASKATOON *(Amelanchier alnifolia)*	5	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	-	100
FORBS			
CREEPING MAHONIA *(Berberis repens)*	25	-	100
WESTERN MEADOW RUE *(Thalictrum occidentalis)*	6	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	6	-	100
LINDLEY'S ASTER *(Aster laevis)*	5	-	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	16	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1460M

ASPECT: SOUTH TO SOUTHWEST

SLOPE: 9%

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	152
FORB	210
SHRUB	754
TOTAL	1116

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.6 HA/AUM OR 0.25 AUM/AC

F8a: Aw-Pl/Marsh reedgrass

(Populus tremuloides-Pinus contorta/Calamagrostis canadensis)

n=1 This community is very similar to the Aw-Pb/Marsh reedgrass community described which is found in moist lower slope positions throughout the Porcupine Hills. This community type is successional more advanced than the aspen, balsam poplar dominated community type. Continued succession in the absence of disturbance will be to white spruce. The forage productivity of this community type is moderate, but the majority of production is coming from pinegrass which is generally only palatable to livestock early in the spring. This community should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST
TREES			
LODGEPOLE PINE *(Pinus contorta)*	20	-	100
ASPEN *(Populus tremuloides)*	50	-	100
WHITE SPRUCE *(Picea glauca)*	5	-	100
SHRUBS			
ROSE *(Rosa acicularis)*	4	-	100
DWARF BILBERRY *(Vaccinium caespitosum)*	13	-	100
FORBS			
CREAM COLORED VETCHLING *(Lathyrus ochroleucus)*	10	-	100
TALL LUNGWORT *(Mertensia paniculata)*	6	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	4	-	100
LINDLEY'S ASTER *(Aster laevis)*	19	-	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	17	-	100
FRINGED BROME *(Bromus cilatus)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME :
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION RANGE: 1523(1448-1645)M

ASPECT: VARIABLE

SLOPE: 0-1%

SOIL DRAINAGE: WELL TO MOD. WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

FORB	215(0-646)
GRASS	1120 (938-1342)
TOTAL	1336 (938-1728)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.4 (1.1-1.9) HA/AUM
0.29(0.21-0.37) AUM/AC

F9: Pl-Aw/Snowberry/Kentucky bluegrass

(Pinus contorta-Populus tremuloides/Symphoricarpos occidentalis/Poa pratensis)

n=1 This community type represents an earlier successional stage of the Pl/White meadowsweet and Pl/Pinegrass community types. These communities occupy mesic sites with medium nutrient regimes (Archibald et al. 1996). It appears that this community type was grazed heavily in the past and then rested. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grass, which may indicate that it has been grazed heavily to the point of Kentucky bluegrass invasion and then rested allowing recovery of the native species. This community is very productive for domestic livestock, but Kentucky bluegrass provides a poor source of forage for wintering wildlife.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	30	-	100
ASPEN *(Populus tremuloides)*	15	-	100
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	34	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	14	-	100
THIMBLEBERRY *(Rubus parviflora)*	14	-	100
GROUND JUNIPER *(Juniperus communis)*	5	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	12	-	100
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	8	-	100
SMOOTH ASTER *(Aster laevis)*	6	-	100
DANDELION *(Taraxacum officinale)*	5	-	100
AMERICAN VETCH *(Vicia americana)*	4	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	21	-	100
PINEGRASS *(Calamagrostis rubescens)*	14	-	100
TIMOTHY *(Phleum pratense)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ASPECT: WEST

SLOPE: 26%

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION (KG/HA)

GRASS	668
FORB	774
SHRUB	506
TOTAL	1948

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (1.2-3.5)HA/AUM
0.2(0.11-0.34) AUM/AC

F10: Aw-Fa-Se/Timothy

(Populus tremuloides-Abies lasiocarpa-Picea engelmannii/Phleum pratense)

n=2 This community was described in the Castle area of the province and if left undisturbed would have likely succeeded to a Fa-Se/Heart lv'd arnica-dominated community type. Heavy grazing pressure has shifted the understory away from native species and allowed dandelion, clover, Canada thistle, timothy and Kentucky bluegrass to establish on the site. This change in species composition with increased grazing pressure is similar to work done by Willoughby (1995). The invasion of non-native species onto this site makes this community very productive for domestic livestock, but the presence of overgrazed communities indicates some type of distribution problem and the management of the disposition should be discussed with the permitees.

Plant Composition	**Canopy Cover (%)**		
	Mean	**Range**	**Const.**
Trees			
Engelmann spruce *(Picea engelmannii)*	5	0-10	50
Subalpine fir *(Abies lasiocarpa)*	5	0-10	50
Aspen *(Populus tremuloides)*	84	15-95	100
Shrubs			
Snowberry *(Symphoricarpos occidentalis,S. albus)*	12	9-14	100
Forbs			
Wild strawberry *(Fragaria virginiana)*	13	5-21	100
Dandelion *(Taraxacum offincinale)*	33	17-49	100
Wild white geranium *(Geranium richardsonii)*	24	1-47	100
Smooth aster *(Aster laevis)*	11	1-21	100
Canada thistle *(Cirsium arvense)*	5	3-6	100
Clover *(Trifolium repens)*	20	0-40	50
Grasses			
Timothy *(Phleum pratense)*	25	12-36	100
Kentucky bluegrass *(Poa pratensis)*	11	0-21	50
Mountain brome *(Bromus carinatus)*	7	1-13	100
Slender wheat grass *(Agropyron trachycaulum)*	3	0-6	100

ENVIRONMENTAL VARIABLES

Moisture regime: Mesic

Nutrient regime: Mesotrophic

Elevation: 1402(1370-1434)m

Soil drainage: Well

Ecological Status Score: 6

FORAGE PRODUCTION (KG/HA)

Grass	1328(968-1688)
Forb	346(266-426)
Shrub	232(218-246)
Total	1906(1452-2360)

Ecologically sustainable stocking rate
1.8 (1.2-3.5)ha/AUM
0.2(0.11-0.34) aum/ac

F11: Spruce-Pb/Snowberry

(Picea glauca, P. engelmannii-Populus balsamifera/Symphoricarpos occidentalis)

n=3 Archibald et al. (1996) described a similar Pb/Snowberry-dominated community on moist lower slope positions where seepage occurs in the spring and after heavy rainfalls. They felt succession would be to white spruce. This community is successionally more advanced than the Pb/Snowberry dominated community type. Likely the northerly aspects of the 3 stands described allowed this community to escape the extensive fire history in the area. The high canopy cover of trees and shrubs limits the amount of light reaching the forest floor and therefore there is only moderate amounts of forage available for domestic livestock. This community type would be rated as secondary range.

Plant Composition Canopy Cover (%)

	Mean	Range	Const.
Trees			
Subalpine fir *(Abies lasiocarpa)*	4	0-10	33
Engelmann spruce *(Picea engelmannii)*	15	0-45	33
Balsam poplar (*Populus balsamifera*)	16	0-15	66
White spruce (*Picea glauca*)	5	0-10	66
Shrubs			
Thimbleberry *(Rubus parviflorus)*	1	0-1	33
Snowberry *(Symphoricarpos occidentalis S. albus)*	9	0-16	66
White meadowsweet *(Spiraea betulifolia)*	1	0-2	66
Forbs			
Field Horsetail *(Equisetum arvense)*	8	1-15	100
Lindley's aster *(Aster ciliolatus)*	6	2-9	100
Strawberry *(Fragaria virginiana)*	4	3-5	100
Canada violet *(Viola canadensis)*	3	1-5	100
Dandelion *(Taraxacum officinale)*	2	1-4	100
Northern bedstraw *(Galium boreale)*	2	1-6	100
Grasses			
Marsh reedgrass *(Calamagrostis canadensis)*	7	0-13	66

Environmental Variables

Moisture regime: Mesic to Hygric

Nutrient regime :
Mesotrophic to Permesotrophic

Elevation: 1507(1455-1554)m

Aspect: Northerly

Slope: 2(0-7)%

Soil drainage: Well

Ecological Status Score: 18

Forage Production (kg/ha)

Grass	97(20-252)
Forb	681(232-1018)
Shrub	237(40-540)
Total	1016(524-1578)

Ecologically sustainable stocking rate
1.8 (1.2-3.5)ha/AUM
0.2(0.11-0.34) AUM/ac

F12: Sw-Aw/Scouring rush

(Picea glauca-Populus tremuloides/Equisetum scirpoides)

n=1 This community occupies moist, nutrient rich, lower slope positions. This community is very similar to the Sw/Horsetail community described by Archibald et al. (1996). Archibald et al. felt that the ecosite representing this community represented the wettest and most nutrient rich conditions for the Montane subregion. They felt balsam poplar was the pioneer species on this ecosite and that succession would be to white spruce. The high tree cover limits the light reaching the forest floor. Consequently, there is little forage available for domestic livestock. This community should be rated as non-use.

PLANT COMPOSITION

	Canopy Cover (%)		
	Mean	Range	Const.
Trees			
Aspen *(Populus tremuloides)*	15	-	100
White spruce *(Picea glauca)*	60	-	100
Balsam poplar *(Populus balsamifera)*	10	-	100
Shrubs			
Rose *(Rosa acicularis)*	3	-	100
Forbs			
Dandelion *(Taraxacum offincinale)*	4	-	100
Dwarf scouring rush *(Equisetum scirpoides)*	20	-	100
Lindley's aster *(Aster ciliolatus)*	4	-	100
American vetch *(Vicia americana)*	1	-	100
Grasses			
Kentucky bluegrass *(Poa pratensis)*	7	-	100
Hairy wild rye *(Elymus innovatus)*	5	-	100

ENVIRONMENTAL VARIABLES

Moisture regime: Subhygric

Nutrient regime: Permesotrophic

Elevation: 1494 m

Slope: 1%

Aspect: Southeast

Soil drainage: Moderately well

Ecological Status Score: 18

FORAGE PRODUCTION (KG/HA)

Total 800 kg/ha*

(*Estimated)

Ecologically sustainable stocking rate
generally non-use
2.2 ha/AUM or 0.18 AUM/ac

MONTANE SUBREGION

DECIDUOUS COMMUNITY TYPES

Photo 10: This Aw/Cow parsnip community type is typical of moist, nutrient-rich seepage areas north of the Crowsnest Pass. South of the pass cow parsnip is often replaced by thimbleberry.

Key to Deciduous community types

1. Site is wet with Balsam poplar dominating the overstory.. 2
Drier sites with Aspen dominating the overstory.. 5

2. Marsh reedgrass dominates the understory. Site is in the lower slope position where it receives some nutrient rich seepage during the growing season. Community type is generally found north of the Porcupine Hills on North or Easterly aspects..**Aw-Pb/Marsh reedgrass** g9a
Richer sites with more moisture dominated by Thimbleberry, Cow parsnip, or Snowberry in the understory. Sites also found at lower slope positions and receive nutrient seepage at some point in the year.. 3
3. Site is moist as indicated by Thimbleberry in the understory and Balsam poplar dominating the overstory. Community type described at higher subalpine elevations near Waterton Lakes Park..**Pb/Thimbleberry** g12
Cow parsnip, or Snowberry dominates the understory.. 4
4. Site is similar to Pb/Timothy but subhygric with Cow parsnip dominating the understory and was described North of the Crowsnest pass..**Pb/Cow parsnip/Kentucky bluegrass** g13
Snowberry dominates the understorey..**Pb/Snowberry/K. bluegrass** g14
5. Dry sites found on upper slope positions and hilltops dominated by Bearberry and Rough fescue..**Aw/Bearberry/Rough fescue** g1
Mesic to wet sites.. 6
6. Mesic sites dominated by White meadowsweet, Pinegrass, Hairy wildrye, or Snowberry and includes grazed sites with Kentucky bluegrass, timothy and dandelion.. 7
Wet sites and moist seeps, Willow, Birch, Thimbleberry, Cow parsnip dominated.. 15
7. Grazed sites dominated by Kentucky bluegrass, Timothy and Dandelion.. 8
Ungrazed sites where White meadowsweet, Pinegrass, Hairy wildrye, Snowberry, Rose, Saskatoon, dominate the understory.. 10
8. Snowberry and Kentucky bluegrass dominated. A heavily grazed site that has been rested enough that some native species have recovered..**Aw/Snowberry/Kentucky bluegrass** g9
Timothy or Pinegrass dominant with Kentucky bluegrass.. 9
9. Timothy and Kentucky bluegrass dominated. Site has been heavily grazed recently, and not rested enough to allow the re-establishment of native vegetation..**Aw/Timothy-Kentucky bluegrass** g7
Pinegrass and Kentucky bluegrass dominated. Site had been grazed heavily and rested resulting in re-establishment of some native species..**Aw/Pinegrass-Kentucky bluegrass** g6
10. Drier sites with poorer nutrient regimes(hairy wildrye dominates understory).. 11
Wetter more nutrient rich sites.. 12
11. Site is found in the Ya Ha Tinda area and has insignificant or no shrub layer. Hairy wildrye is the dominant grass..**Aw/Hairy wildrye** g3
Site has a shrub layer of Rose..**Aw/Rose/Hairy wildrye** g2
12. Site is rich with Snowberry and/or Saskatoon as the dominant shrubs.. 13
Site is not so rich and is dominated by White meadowsweet and Pinegrass.. 14
13. Snowberry is dominant..**Aw/Snowberry/Kentucky bluegrass** g9
Saskatoon and Snowberry are dominant..**Aw/Snowberry-Saskatoon** g8
14. Site contains White meadowsweet..**Aw/White meadowsweet/Pinegrass** g4
Site dominated by Pinegrass, no White meadowsweet..**Aw/Rose/Pinegrass** g5

15. Site found in a riparian zone..**Aw/Birch-Willow** g15
Site is a nutrient rich seep at some point in the year, not in riparian zone.. 16
16. Nutrient rich seepage area south of the Crowsnest Pass..**Aw/Thimbleberry** g10
Nutrient rich seepage area north of the Crowsnest Pass..**Aw/Cow parsnip** g11

G1: Aw/Bearberry/Rough fescue

(Populus tremuloides/Arctostaphylos uva-ursi/Festuca scabrella)

n=8 This community type occupies dry, upper slope and hilltop positions and represents the invasion of aspen onto a Rough fescue-Sedge/Bearberry-dominated community type. The soils on this community type are fairly well developed and the moisture conditions are high enough to favour the growth of aspen. In years of drought aspen will likely die back in this community type. Frequent fire also tends to control the spread of aspen onto these rough fescue dominated grasslands. The lack of fire in the last 50 years has allowed many of these grasslands to be invaded by aspen. Invasion of aspen causes a 50% decline in forage productivity and a loss in soil productivity.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	 RANGE	 CONST.
TREES			
ASPEN *(Populus tremuloides)*	50	30-75	100
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-6	38
ROSE *(Rosa acicularis)*	3	0-15	50
SNOWBERRY *(Symphoricarpos albus)*	2	0-9	25
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	19	1-37	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	0-14	75
STRAWBERRY *(Fragaria virginiana)*	8	1-19	100
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	5	0-16	75
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	9	0-15	75
PINEGRASS *(Calamagrostis rubescens)*	20	0-57	88
IDAHO FESCUE *(Festuca idahoensis)*	3	0-12	50
HAIRY WILDRYE *(Elymus innovatus)*	5	0-19	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1495(1420-1570) M

SOIL DRAINAGE: WELL

SLOPE: 7(0-15)%

ASPECT: SOUTH

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	578(318-1070)
FORB	220(0-462)
SHRUB	148(14-318)
TOTAL	946(436-1528)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.0 (1.8-2.6) HA/AUM
0.2(0.15-0.2) AUM/AC

G2: Aw/Rose/Hairy wildrye

(Populus tremuloides/Rosa acicularis/Elymus innovatus)

n=5 This community type occurs on submesic, well drained, south and west-facing slopes. It is situated in slightly lower slope positions and therefore has better developed soils than the limber pine and bearberry-dominated community types previously described. Archibald et al. (1996) described this community type as being part of the Canada buffaloberry-hairy wildrye ecosite. They felt this ecosite to be relatively dry for the subregion, but not as dry as the limber pine and bearberry ecosites. Succession on this site will likely be to the Pl/Buffaloberry/Pinegrass or Fd/Hairy wildrye-dominated community types previously described. This community type has a moderate amount of forage for domestic livestock. It should be rated as secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	62	36-75	100
SHRUBS			
ROSE *(Rosa acicularis)*	14	4-40	100
SHRUBBY CINQUEFOIL (*Potentilla fruticosa*)	1	0-1	40
SNOWBERRY (*Symphoricarpos occidentalis*)	2	0-3	60
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	5	1-11	100
WILD STRAWBERRY *(Fragaria virginiana)*	12	3-29	100
DANDELION *(Taraxacum officinale)*	4	1-8	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	4	1-8	100
FIREWEED (*Epilobium angustifolium*)	2	0-8	60
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	25	16-37	100
ROUGH FESCUE *(Festuca scabrella)*	2	0-4	60
PINEGRASS (*Calamagrostis rubescens*)	4	0-12	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION :1589 (1350-2270) M

SLOPE: 4(0-10)%

ASPECT: SOUTHERLY

SOIL DRAINAGE: WELL TO RAPIDLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	856(374-1906)
FORB	313(222-408)
SHRUB	75(0-252)
TOTAL	1244(652-2330)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (1.2-4.4) HA/AUM
0.3(0.1-0.35) AUM/AC

G3: Aw/Hairy wildrye

(Populus tremuloides/Elymus innovatus)

n=1 This community type occurs on submesic, well drained, south and west-facing slopes within the Ya Ha Tinda area. It occurs in areas of the grasslands where moisture is sufficient to grow trees. Beckingham et al. (1996) described this community type as being part of the hairy wildrye ecosite. They felt this ecosite to be relatively dry for the subregion, but not as dry as the bearberry and grassland ecosites. Succession on this site will likely be to the Pl/Hairy wildrye or Sw/Hairy wildrye-dominated community types previously described. This community type has a high amount of forage because of the increased moisture. In the winter elk often occupy these sites as bedding areas during the day. The southerly and westerly aspect increases solar gains and the trees provide a degree of security.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	35	-	100
SHRUBS			
SHRUBBY CINQUEFOIL			
(*Potentilla fruticosa*)	1	-	100
FORBS			
AMERICAN VETCH			
(Vicia americana)	6	-	100
WILD STRAWBERRY			
(Fragaria virginiana)	18	-	100
YARROW			
(Achillea millefolium)	5	-	100
YELLOW PEAVINE			
(Lathyrus ochroleucus)	2	-	100
NORTHERN BEDSTRAW			
(*Galium boreale*)	3	-	100
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	22	-	100
ROUGH FESCUE			
(Festuca scabrella)	4	-	100
TIMOTHY			
(*Phleum pratense*)	4	-	100
FRINGED BROME			
(*Bromus ciliatus*) 4	-	100	

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1700 M

SLOPE:
10%

ASPECT:
SOUTHERLY

SOIL DRAINAGE:
WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	836
FORB	1228
TOTAL	2064

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.5 (1.2-4.4) HA/AUM
0.3(0.1-0.35) AUM/AC

G4: Aw/White meadowsweet/Pinegrass
(Populus tremuloides/Spiraea betulifolia/Calamagrostis rubescens)

n=16 This community is one of several community types which represent the mesic/medium ecosite for the Montane subregion. These sites can be dominated by Douglas fir, white spruce, aspen or lodgepole pine. The understory can be dominated by white meadowsweet, pinegrass or feather moss depending upon the successional status of the stand. In the vicinity of the Crowsnest Pass creeping mahonia is also common on these sites (Archibald et al. 1996). White meadowsweet is well adapted to growing on dry rocky slopes (MacKinnon et al. 1992). The presence of a high cover of white meadowsweet may indicate slightly drier conditions and shallower soils than a community dominated by pinegrass. Because this community type is in an early successional stage it produces a moderate amount of forage for domestic livestock and should be considered secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	45	25-74	100
LODGEPOLE PINE			
(Pinus contorta)	2	0-15	31
SHRUBS			
WHITE MEADOWSWEET			
(Spiraea betulifolia)	20	10-39	100
ROSE			
(Rosa acicularis.)	4	0-11	94
DWARF BILBERRY			
(Vaccinium caespitosum)	2	0-14	25
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	1	0-2	25
CANADA BUFFALOBERRY			
(Shepherdia canadensis)	T	0-2	25
FORBS			
SHOWY ASTER			
(Aster conspicuus)	9	1-23	100
STRAWBERRY			
(Fragaria virginiana)	6	1-15	100
NORTHERN BEDSTRAW			
(Galium boreale)	2	1-3	100
YELLOW PEAVINE			
(Lathyrus ochroleucus)	7	0-14	94
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	4	0-15	63
SEDGE			
(Carex spp.)	1	0-5	30
PINEGRASS			
(Calamagrostis rubescens)	23	8-51	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION RANGE (MEAN): 1568(1460-1676) M

ASPECT: SOUTH TO WEST

SLOPE: 9(0-25)%

SOIL DRAINAGE: WELL TO MOD. WELL
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	791(332-2102)
FORB	581(404-976)
SHRUB	169(0-216)
TOTAL	1498(852-2834)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (1.2-4.4) HA/AUM
0.25(0.1-0.35) AUM/AC

G5: Aw/Rose/Pinegrass

(Populus tremuloides/Rosa acicularis/Calamagrostis rubescens)

n=35 This community, dominated by a aspen overstory and an understory of pinegrass, and represents an earlier successional stage of the Pl/Pinegrass community type. This community is also very similar to the previously described Aw/White meadowsweet/Pinegrass community type, but the high cover of pinegrass and low cover of white meadowsweet may indicate slightly moister, better developed soils. Pinegrass is generally unpalatable to livestock, but if it is grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is moderate. As a result, this community should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR			
(Populus balsamifera)	2	0-35	14
ASPEN			
(Populus tremuloides)	47	3-70	100
SHRUBS			
ROSE			
(Rosa acicularis)	8	0-22	85
WHITE MEADOWSWEET			
(Spiraea betulifolia)	1	0-12	35
SASKATOON			
(*Amelanchier alnifolia*)	1	0-2	53
FORBS			
YELLOW PEAVINE			
(Lathyrus ochroleucus)	5	0-11	91
NORTHERN BEDSTRAW			
(*Galium boreale*)	2	0-4	97
STRAWBERRY			
(*Fragaria virginiana*)	9	0-20	97
AMERICAN VETCH			
(*Vicia americana*)	4	0-8	91
LINDLEY'S ASTER			
(*Aster ciliolatus*)	7	0-25	82
SHOWY ASTER			
(*Aster conspicuus*)	5	0-31	67
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	18	0-51	94
HAIRY WILDRYE			
(Elymus innovatus)	6	0-23	82

ENVIRONMENTAL VARIABLES

MOISTURE REGIME : SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION RANGE: 1532(1360-1710)

ASPECT: SOUTHERLY

SOIL DRAINAGE: WELL

SLOPE: 11(0-15)%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION(KG/HA)

GRASS	786(0-3318)
FORB	532(0-1584)
SHRUB	91(0-378)
TOTAL	1408(538-2204)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.3 (1.0-4.4) HA/AUM
0.3(0.1-0.4) AUM/AC

G6: Aw/Pinegrass-Kentucky bluegrass

(Populus tremuloides/Calamagrostis rubescens-Poa pratensis)

n=7 This community type is very similar to the previously described Aw/Rose/Pinegrass community, but has been grazed by livestock. It appears that this community type was grazed heavily in the past and then rested. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grass, which may indicate that it has been grazed heavily to the point of Kentucky bluegrass invasion and then rested allowing recovery of the native species. This community is very productive for domestic livestock, but Kentucky bluegrass provides a poor source of forage for wintering wildlife.

Plant Composition

Plant Composition	Canopy Cover (%) Mean	Range	Const.
Trees			
Aspen *(Populus tremuloides)*	29	15-40	100
Shrubs			
Wild red raspberry *(Rubus idaeus)*	9	1-26	100
Rose (*Rosa acicularis*)	12	1-25	100
Forbs			
Strawberry *(Fragaria virginiana)*	8	1-15	100
Smooth aster *(Aster laevis)*	2	0-7	29
Dandelion *(Taraxacum officinale)*	6	2-11	100
Wild white geranium *(Geranium richardsonii)*	6	0-19	86
Yellow peavine (*Lathyrus ochroleucus*)	4	1-7	100
Grasses			
Pinegrass *(Calamagrostis rubescens)*	11	2-28	100
Hairy wildrye *(Elymus innovatus)*	1	0-5	57
Kentucky bluegrass (*Poa pratensis*)	12	0-27	86
Timothy *(Phleum pratense)*	4	0-11	71

Environmental Variables

Moisture regime: mesic

Nutrient regime: mesotrophic

Elevation: 1489(1432-1600) m

Aspect: Southerly

Slope: 13(5-20)%

Soil drainage: Well

Ecological Status Score: 12

Forage Production(kg/ha)

Grass	902(0-2402)
Forb	663(194-884)
Shrub	102(0-236)
total	1668(770-3286)

Ecologically sustainable stocking rate
1.3 (1.0-4.4) ha/AUM
0.3(0.1-0.4) AUM/ac

G7: Aw/Timothy-Kentucky bluegrass

(Populus tremuloides/Phleum pratense-Poa pratensis)

n=13 This community is similar to the Aw/Rose/Pinegrass community, but heavy grazing pressure has shifted the understory away from native species and allowed dandelion, clover, timothy and Kentucky bluegrass to establish on the site. This change in species composition with increased grazing pressure is similar to work done by Willoughby (1995). The invasion of non-native species onto this site makes this community very productive for domestic livestock, but the presence of overgrazed communities indicates some type of distribution problem and the management of the disposition should be discussed with the permittees.

PLANT COMPOSITION	**CANOPY COVER (%)**		
	MEAN	**RANGE**	**CONST.**
TREES			
ASPEN *(Populus tremuloides)*	65	40-80	100
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	6	0-20	76
SNOWBERRY (*Symphoricarpos occidentalis*)	4	0-9	75
ROSE (*Rosa acicularis*)	7	0-20	69
FORBS			
DANDELION *(Taraxacum officinale)*	6	0-39	85
WILD BERGAMONT *(Monarda fistulosa)*	1	0-11	31
STRAWBERRY *(Fragaria virginiana)*	4	0-10	92
WILD WHITE GERANIUM *(Geranium richardsonii)*	2	0-11	69
CLOVER *(Trifolium hybridum)*	2	0-20	23
GRASSES			
TIMOTHY *(Phleum pratense)*	13	1-41	100
KENTUCKY BLUEGRASS (*Poa pratensis*)	5	0-26	55
SMOOTH BROME (*Bromus inermis*)	2	0-14	39

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1395(1250-1536)M

ASPECT: SOUTHERLY

SLOPE: 8(0-20)%

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION (KG/HA)

GRASS	1006(794-1242)
FORB	114(0-176)
SHRUB	242(0-854)
TOTAL	1362(1034-1824)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.3 (1.0-4.4) HA/AUM
0.3(0.1-0.4) AUM/AC

G8: Aw/Snowberry-Saskatoon

(Populus tremuloides/Symphoricarpos occidentalis(S.albus)-Amelanchier alnifolia)

n=11 This community is one of several community types which represent the mesic/rich ecosite for the Montane subregion (Archibald et al. 1996). These sites can be dominated by white spruce, aspen or lodgepole pine. The understory can be dominated by thimbleberry, snowberry, saskatoon or pinegrass. Succession of this community type will likely be to white spruce. The Aw/Thimbleberry dominated community type is probably moister and slightly richer than this community type. Forage production on the aspen phase of this ecosite can be quite high averaging 1278 kg/ha. This makes these community types moderately productive for domestic livestock and should be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	66	45-99	100
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	13	0-28	82
SNOWBERRY *(Symphoricarpos occidentalis, S. albus)*	32	2-97	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	4	0-19	36
ROSE (*Rosa acicularis*)	4	0-9	73
FORBS			
STRAWBERRY *(Fragaria virginiana)*	5	1-15	91
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-19	64
YELLOW PEAVINE *(Lathyrus ochroleucus)*	3	0-8	82
SHOWY ASTER *(Aster conspicuus)*	2	0-10	45
CANADA VIOLET (*Viola canadensis*)	4	0-13	54
COW PARSNIP (*Heracleum lanatum*)	6	0-10	45
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	2	0-6	45
PINEGRASS *(Calamagrostis rubescens)*	3	0-14	73
KENTUCKY BLUEGRASS (*Poa pratensis*)	2	0-6	64

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC-SUBHYGRIC
NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC
ELEVATION RANGE : 1486(1370-1680) M
ASPECT: SOUTH TO EAST
SLOPE: 21(0-35)%
SOIL DRAINAGE: WELL TO MOD. WELL
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	653(42-1538)
FORB	406(300-1014)
SHRUB	346(10-1022)
TOTAL	1286(520-1708)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (1.2-4.4) HA/AUM
0..25(0.1-0.35) AUM/AC

G9: Aw/Snowberry/Kentucky bluegrass

(Populus tremuloides/Symphoricarpos albus/Poa pratensis)

n=2 This community type is very similar to the previously described Aw/Snowberry-Saskatoon community, but has been grazed by livestock. It appears that this community type was grazed heavily in the past and then rested. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grass, which may indicate that it has been grazed heavily to the point of Kentucky bluegrass invasion and then rested allowing recovery of the native species. This community is very productive for domestic livestock, but Kentucky bluegrass provides a poor source of forage for wintering wildlife.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	64	50-78	100
WHITE SPRUCE *(Picea glauca)*	3	2-3	100
SHRUBS			
ROSE *(Rosa acicularis)*	6	3-7	100
RED TWINBERRY *(Lonicera utahensis)*	2	0-4	50
SASKATOON *(Amelanchier alnifolia)*	1	0-2	50
SNOWBERRY *(Symphoricarpos albus)*	21	16-24	100
FORBS			
CREEPING MAHONIA *(Berberis repens)*	12	7-17	100
DANDELION *(Taraxacum officinale)*	7	1-12	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	2	1-3	100
STRAWBERRY *(Fragaria virginiana)*	2	1-2	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	4	0-7	50
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	24	17-34	100
MOUNTAIN BROME *(Bromus carinatus)*	8	0-16	50
ONION GRASS *(Melica spectabilis)*	5	0-9	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL TO RAPIDLY

ELEVATION: 1414(1372-1457)M

ASPECT: SOUTHERLY

SLOPE: 3(2-4)%

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION(KG/HA)

GRASS	606(516-696)
FORB	749(734-764)
SHRUB	354(0-708)
TOTAL	1709(1460-1958)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (1.2-4.4) HA/AUM
0.3(0.1-0.35) AUM/AC

G9a: Aw-Pb/Marsh reedgrass

(Populus tremuloides-P.balsamifera/Calamagrostis canadensis)

n=8 This community type was described on lower slope positions where some nutrient rich seepage occurs during the growing season. It is generally found north of the Porcupine Hills in areas that have north and easterly aspects. Marsh reedgrass is not common in the Montane subregion and the presence of this grass species may indicate that the climate is closer to the Lower Foothills or Subalpine subregion. This community type has a low shrub cover and extensive cover of grass which makes it fairly attractive to livestock. Often these community types are heavily utilized.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	43	20-60	100
BALSAM POPLAR *(Populus balsamifera)*	9	0-25	38
SHRUBS			
ROSE *(Rosa acicularis)*	1	0-2	63
SASKATOON *(Amelanchier alnifolia)*	2	0-15	13
FORBS			
FIREWEED *(Epilobium angustifolium)*	7	1-14	100
DANDELION *(Taraxacum officinale)*	5	1-9	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	4	0-10	63
STRAWBERRY *(Fragaria virginiana)*	4	1-8	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	6	0-18	63
WILD WHITE GERANIUM *(Geranium richardsonii)*	12	0-27	88
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-16	63
MARSH REEDGRASS *(Calamagrostis canadensis)*	20	10-38	100
FRINGED BROME *(Bromus cilatus)*	3	0-7	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1494(1417-1570)M

ASPECT: NORTHERLY, EASTERLY

SLOPE: 4(0-10)%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION(KG/HA)

GRASS	1042(0-2568)
FORB	404(186-498)
SHRUB	39(0-144)
TOTAL	1485(960-2568)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.2 (1.0-4.4) HA/AUM
0.35(0.1-0.4) AUM/AC

G10: Aw/Thimbleberry

(Populus tremuloides/Rubus parviflorus)

n=8 Nutrient rich seepage occurs at some point in the growing season in this community type favouring the growth of thimbleberry. On these sites thimbleberry is very common south of the Crowsnest Pass and is generally replaced by cow parsnip north of the Pass. Succession on these sites will be from aspen to pine and then to white spruce. Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Thimbleberry is generally unpalatable to livestock, but if the site has an abundance of cow parsnip it may be extensively utilized. This community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	1	0-5	33
ASPEN *(Populus tremuloides)*	70	30-90	100
BALSAM POPLAR *(Populus balsamifera)*	3	0-21	25
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	4	0-12	63
THIMBLEBERRY *(Rubus parviflorus)*	39	11-66	100
SNOWBERRY (*Symphoricarpos occidentalis*)	6	0-15	63
SASKATOON (*Amelanchier alnifolia*)	6	0-33	50
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	4	0-11	88
SHOWY ASTER *(Aster conspicuus)*	3	0-11	75
COW PARSNIP *(Heracleum lanatum)*	4	0-24	38
VEINY MEADOW RUE *(Thalictrum venulosum)*	5	0-13	75
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-3	63
WILD WHITE GERANIUM *(Geranium richardsonii)*	4	0-10	88
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	1	0-3	25
PINE GRASS *(Calamagrostis rubescens)*	4	0-15	38
KENTUCKY BLUEGRASS (*Poa pratensis*)	1	0-15	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO MESIC

NUTRIENT REGIME : PERMESOTROPHIC

ELEVATION: 1633(1562-1707)M

ASPECT: SOUTHERLY

SLOPE:15(5-20)%

SOIL DRAINAGE: WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	575(232-1194)
FORB	454(300-658)
SHRUB	380(172-584)
TOTAL	1410(1108-1878)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (1.0-4.4) HA/AUM
0.3(0.1-0.35) AUM/AC

G11: Aw/Cow parsnip
(Populus tremuloides/Heracleum lanatum)

n=6 Nutrient rich seepage occurs at some point in the growing season favouring the growth of cow parsnip.This community type is very similar to the Aw/Thimbleberry community, but is more common north of the Crowsnest Pass. Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Cow parsnip is palatable to livestock and maybe extensively utilized. This community type should be rated as secondary range.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	58	25-90	100
SHRUBS			
ROSE *(Rosa acicularis)*	2	0-6	71
WHITE MEADOWSWEET *(Spiraea betulifolia)*	4	0-15	57
FORBS			
COW PARSNIP *(Heracleum lanatum)*	30	3-65	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	7	0-17	86
SHOWY ASTER *(Aster conspicuus)*	6	0-12	86
STRAWBERRY *(Fragaria virginiana)*	3	0-6	86
FIREWEED *(Epilobium angustifolium)*	7	1-32	86
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	6	9-19	57
SMOOTH WILDRYE *(Elymus glaucus)*	3	0-7	57

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO MESIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1502(1402-1615)M

ASPECT: SOUTHERLY

SLOPE: 14(0-20)%

SOIL DRAINAGE: MOD. WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION(KG/HA)

GRASS	642(364-812)
FORB	2262(214-6278)
SHRUB	62(0-198)
TOTAL	2766(624-6688)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.9 (0.6-2.5) HA/AUM
0.45(0.15-0.65) AUM/AC

G12: Pb/Thimbleberry

(Populus balsamifera/Rubus parviflorus)

n=2 This community type was described in the Southend allotment just north of Waterton Lakes National Park. It was found in a moist, nutrient rich, lower slope position, which favours the growth of both balsam poplar and thimbleberry. It is very similar to the Aw/Thimbleberry community previously described, but the higher elevation is out of the range of growth conditions for aspen. As a result, balsam poplar dominates the site.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	68	50-85	100
ASPEN *(Populus tremuloides)*	22	3-40	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	39	30-58	100
WILLOW *(Salix spp.)*	15	0-30	50
SNOWBERRY (*Symphoricarpos occidentalis*)	13	6-20	100
FORBS			
JESSICA'S STICKSEED *(Hackelia jessicae)*	5	0-10	50
SMOOTH SWEET CICELY *(Osmorhiza chilensis)*	3	0-6	50
CANADA VIOLET *(Viola canadensis)*	4	1-7	100
BANEBERRY *(Actaea rubra)*	13	6-20	100
GREEN FALSE HELLEBORE (*Veratrum eschscholtzii*)	3	0-6	50
GRASSES			
ALASKA ONION GRASS *(Melica subulata)*	1	0-2	50
NODDING TRISETUM *(Trisetum cernuum)*	2	1-3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1564(1420-1707) M

SLOPE: 4%

ASPECT: SOUTHEAST

SOIL DRAINAGE: MODERATELY WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	36
FORB	1234
SHRUB	684
TOTAL	1954

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.8 (1.0-4.4) HA/AUM
0.3(0.1-0.35) AUM/AC

G13: Pb/Cow parsnip/Kentucky bluegrass
(Populus balsamifera/Heracleum lanatum/Poa pratensis)

n=2 This community type occupies subhygric, lower slope positions. It is similar to the Pb/Thimbleberry community type previously described, but lacks the cover of thimbleberry. Generally, thimbleberry is replaced by cow parsnip north of the Crowsnest Pass. The high moisture and nutrient content of this site make it highly productive. Domestic livestock find cow parsnip palatable. This community should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	67	60-74	100
SHRUBS			
STICKY CURRANT *(Ribes viscosissimum)*	4	0-8	50
ROSE (*Rosa acicularis*)	3	0-5	50
FORBS			
SHOWY ASTER *(Aster conspicuus)*	13	0-25	50
CANADA VIOLET *(Viola canadensis)*	12	0-24	50
SWEET CICELY *(Osmorhiza chiiensis)*	6	0-11	50
COW PARSNIP *(Heracleum lanatum)*	9	8-10	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	3	1-6	100
GRASSES			
SEDGE *(Carex spp.)*	6	0-11	50
KENTUCKY BLUEGRASS (*Poa pratensis*)	10	10-10	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1387(1350-1424) M

SLOPE: 3 %

ASPECT: SOUTHWEST

SOIL DRAINAGE: MODERATELY WELL

ECOLOGICAL STATUS SCORE: 12

FORAGE PRODUCTION(KG/HA)

GRASS	4
FORB	856
SHRUB	1010
TOTAL	1870 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.9 (0.6-2.5) HA/AUM
0.45(0.15-0.65) AUM/AC

G14: Pb/Snowberry/Kentucky bluegrass

(Populus balsamifer/Symphoricarpos occidentalis/Poa pratensis)

n=12 This community is very similar to the Pb/Snowberry dominated community described by Archibald et al. (1996) on moist lower slope positions where seepage occurs in the spring or after heavy rain. It is also similar to the Spruce-Pb/Snowberry previously described, but this community is not as successionally advanced. The high moisture and nutrient content of the site makes this community highly productive, but the majority of the production is coming from snowberry which is generally unpalatable to livestock at proper stocking levels. This community should be rated as secondary range.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	58	30-65	100
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis,S. albus)*	31	1-54	100
THIMBLEBERRY *(Rubus parviflorus)*	1	0-3	50
WATER BIRCH *(Betula occidentalis)*	8	0-44	33
FORBS			
CANADA VIOLET *(Viola canadensis)*	12	0-30	78
WILD WHITE GERANIUM *(Geranium richardsonii)*	5	0-10	79
VEINY MEADOW RUE *(Thalictrum occidentalis)*	6	0-15	78
DANDELION (*Taraxacum officinale*)	6	1-20	100
STRAWBERRY (*Fragaria virginiana*)	3	0-5	69
GRASSES			
TIMOTHY *(Phleum pratense)*	6	0-40	56
KENTUCKY BLUEGRASS (*Poa pratensis*)	9	0-80	11

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1450(1261-1527) M

SLOPE: 1(0-2)%

ASPECT: NORTH

SOIL DRAINAGE: MOD.WELL TO WELL

ECOLOGICAL STATUS SCORE: 12

FORAGE PRODUCTION(KG/HA)

GRASS	382(44-732)
FORB	483(224-646)
SHRUB	893(530-1574)
TOTAL	1760(1554-1884)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.3 (1.2-4.4) HA/AUM
0.3(0.1-0.35) AUM/AC

G15: Aw-Pb/Birch-Willow

(Populus tremuloides/Betula occidentalis-Salix glauca)

n=2 This community was described adjacent to a pond in the Southend allotment just north of Waterton Lakes National Park. Both water birch and smooth willow are well adapted to growing adjacent to streams and ponds. What is unusual about this community is the high aspen and pinegrass cover. Aspen and pinegrass are usually associated with more mesic sites. The high cover of willow, water birch and aspen limit the light reaching the forest floor. Therefore there is only moderate production for domestic livestock. This community should be rated as non-use.

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
Trees			
Aspen *(Populus tremuloides)*	45	0-90	50
White spruce (*Picea glauca*)	2	0-4	50
Balsam poplar (*Populus balsamifera*)	30	0-60	50
Shrubs			
Water birch *(Betula occidentalis)*	21	20-21	100
Smooth willow *(Salix glauca)*	11	0-21	50
Snowberry *(Symphoricarpos occidentalis)*	7	0-14	50
Buffaloberry (*Shepherdia canadensis*)	8	1-14	100
Forbs			
Showy aster *(Aster conspicuus)*	5	0-10	50
Strawberry *(Fragaria virginiana)*	4	1-7	100
Wintergreen *(Pyrola asarifolia)*	4	0-7	50
Smooth aster (*Aster laevis*)	5	3-7	100
Veiny meadow rue (*Thalictrum venulosum*)	2	1-4	100
Grass			
Pinegrass (*Calamagrostis rubescens*)	7	0-15	100
Kentucky bluegrass (*Poa pratensis*)	5	1-10	100

Environmental Variables

Moisture regime: Subhygric

Nutrient regime: PerMesotrophic

Elevation: 1500(1400-1600)m

Soil drainage: Moderately well to poorly

Ecological Status Score: 18

FORAGE PRODUCTION(KG/HA)

Grass	804
Forb	452
Shrub	622
Total	1878

Ecologically sustainable stocking rate
1.5 ha/AUM or 0.3 AUM/ac

MONTANE CUTBLOCKS

In order to classify the cutblocks of the Montane subregion properly and understand the successional sequences which occur after harvesting the preharvest community type and year the stand was harvested must be determined. This information was not available for this classification and therefore it was difficult to determine the successional pathways. For example many cutblocks in the Castle area and Porcupine Hills are not regenerating trees. It is not clear if these sites will always have difficulty growing trees because they were historically grasslands or if some other disturbance factor is influencing tree regeneration. Heavy grazing and competition from grass species can influence tree regeneration, heavy grazing pressure was described on a number of cutblocks in the Castle area. These cutblocks had been grazed so heavily that the agronomic species (Kentucky bluegrass, timothy and clover) dominated the sites and a number of sites had been seeded with creeping red fescue which can compete with tree seedlings for moisture and nutrients.

Cutblocks can be an important source of forage for domestic livestock. They produce on average twice as much as deciduous stands and nearly three times more than conifer stands. This production varies from area to area in the Montane. Generally the production averages 1800 to 1900 kg/ha in the Castle and Porcupine Hills and drops dramatically in the Gap area to 700 kg/ha. It must be remembered that this increase in forage is only temporary. As the cutblock undergoes succession there will be a corresponding drop in forage production. Increases in carrying capacity after harvesting can be acquired through a temporary permit.

In order to understand the forage productivity on cutblocks between different areas of the Montane the cutblocks were split into the Gap, Castle and Porcupine Hills. It must be remembered that maximum forage productivity does not occur on a cutblock until it is approximately 3 years old. One year old cutblocks will generally have less than half the total production of a 3 year old block.

Table 5. Cutblock community types in the Montane subregion.

Community number	Community type	Productivity (kg/ha)				Moisture	Drainage	Carrying Capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
	Cutblocks in Gap area							
H1	Pine blocks	307	416	15	739	Mesic	Well	2.5
H2	Pine-Spruce blocks	112	580		692	Mesic	Well	2.6
	Cutblocks in Castle area							
H3	Kentucky bluegrass-Timothy	1208	789	184	2181	Mesic	Well	0.8
H4	Creeping red fescue	503	704	457	1663	Mesic	Well	1.1
H5	Beaked sedge	3994	16	0	4010	Hygric	Poorly	0.5
H6	Subalpine fir	550	1106	190	1846	Mesic	Well	2.6
H7	Pine-Spruce/Pinegrass	689	804	58	1646	Mesic	Well	2.6
	Cutblocks in Porcupine Hills							
H8	Spruce-Pine blocks	707	95	62	864	Mesic	Well	2.6
H9	Douglas fir blocks	1710	528	191	2429	Mesic	Well	2.6
H10	Scarified blocks				2000*	Mesic	Well	2.6

* Estimate

H1: Pine blocks (Gap)

(Pinus contorta)

n=24 These cutblocks were described in the Gap allotment just north of Crowsnest Mountain. These blocks are probably more representative of the Subalpine subregion than the Montane.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONTS.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	6	0-20	75
WHITE SPRUCE *(Picea glauca)*	3	0-14	46
SHRUBS			
BRISTLY BLACK CURRANT *(Ribes lacustre)*	5	0-14	46
FORBS			
FIREWEED *(Epilobium angustifolium)*	5	0-33	100
STRAWBERRY *(Fragaria virginiana)*	12	0-30	96
HEART-LEAVED ARNICA *(Arnica cordifolia)*	4	0-10	88
DANDELION *(Taraxacum officinale)*	2	0-6	75
SMOOTH ASTER *(Aster laevis)*	5	0-16	58
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	7	0-31	83
SEDGE SPP. *(Carex spp.)*	5	0-21	58
HAIRY WILDRYE *(Elymus innovatus)*	3	0-22	46

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: Mesic

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1767(1585-1890) M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	307(0-962)
FORB	416(140-586)
SHRUB	15(0-84)
TOTAL	739(408-1102)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.5 (1.7-4.5) HA/AUM
0.16(0.09-0.23) AUM/AC

H2: Pine-Spruce blocks (Gap)
(Pinus contorta-Picea glauca)

n=6

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	15	1-40	100
LODGEPOLE PINE (*Pinus contorta*)	12	0-40	89
SHRUBS			
WILLOW SPP. *(Salix spp.)*	4	0-11	83
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	28	10-43	100
WILD STRAWBERRY *(Fragaria virginiana)*	28	18-41	100
FIREWEED *(Epilobium angustifolium)*	7	3-12	100
DANDELION *(Taraxacum officinale)*	3	1-4	100
FIELD HORSETAIL (*Equisetum arvense*)	5	0-14	83
GRASSES			
SEDGE SPP. *(Carex spp.)*	22	12-34	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	5	0-10	50
PINEGRASS (*Calamagrostis rubescens*)	2	0-11	17

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1752(1707-1829) M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	112(0-276)
FORB	580(0-950)
TOTAL	692(276-954)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.6 (1.9-6.6) HA/AUM
0.16(.06-0.21) AUM/AC

H3: Kentucky bluegrass-Timothy (Castle)

(Poa pratensis-Phleum pratense)

n=12 This community type represents cutblocks that have been heavily grazed by livestock. Heavy livestock grazing favours the growth of invaders Kentucky bluegrass and timothy. The grazing pressure which favours the growth of these grass species is usually detrimental to the growth of trees. Cattle damage to the conifer trees is usually trampling damage which scars the trees and breaks the stem.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	T	0-2	8
LODGEPOLE PINE *(Pinus contorta)*	1	0-8	33
ASPEN *(Populus tremuloides)*	8	0-90	8
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	0-10	42
SASKATOON *(Amelanchier alnifolia)*	1	0-4	33
FORBS			
FIREWEED *(Epilobium angustifolium)*	4	0-23	92
STRAWBERRY *(Fragaria virginiana)*	11	0-26	92
ASTER SPP. *(Aster spp.)*	4	0-10	33
YARROW *(Achillea millefolium)*	9	1-32	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	31	11-91	100
SEDGE *(Carex spp.)*	9	0-47	33
PINEGRASS *(Calamagrostis rubescens)*	7	0-30	67
TIMOTHY *(Phleum pratense)*	7	0-45	58

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE :1491(1372-1707) M

ASPECT: VARIABLE

SLOPE: 9(0-32)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	1208(20-1578)
FORB	789(118-1220)
SHRUB	184(0-540)
TOTAL	2181(1578-2686)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.8(0.7-1.2) HA/AUM
0.5(0.33-0.58) AUM/AC

H4: Creeping red fescue (Castle)

(Festuca rubra)

n=7 This community type represents cutblocks that have been heavily grazed and seeded with creeping red fescue. Creeping red fescue a rhizomatous grass can quickly form a sod on the top of the soil, which makes it difficult to grow trees. These seeded cutblocks can be very productive for domestic livestock, but it will be very difficult to regenerate trees on these sites.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	1	0-9	14
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-13	28
GREEN ALDER (*Alnus crispa*)	8	0-54	43
FORBS			
STRAWBERRY *(Fragaria virginiana)*	3	0-14	57
SHOWY ASTER (*Aster conspicuus*)	1	0-7	29
LINDLEY'S ASTER (*Aster ciliolatus*)	2	0-4	14
CLOVER (*Trifolium repens*)	17	0-69	57
FIREWEED (*Epilobium angustifolium*)	3	0-12	57
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	2	0-8	43
TIMOTHY *(Phleum pratense)*	3	0-15	57
CREEPING RED FESCUE (*Festuca rubra*)	41	15-87	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1560(1433-1829))M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	503(324-770)
FORB	704(0-2036)
SHRUB	457(0-892)
TOTAL	1663(770-2664)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.1(0.7-2.4) HA/AUM
0.36(0.17-0.58) AUM/AC

H5: Beaked sedge(Castle)

(Carex rostrata)

n=1 This community was described in a moist, poorly drained spot within a Pine-Spruce cutblock. It is more representative of a wet sedge meadow. It is likely this community type will never grow trees because of the wet moisture conditions. These sites can be very productive for domestic livestock. When situated within a cutblock the livestock will utilize the drier edges of this community type extensively. This community type may also represent the only water to be found within a cutblock.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
FORBS			
NORTHERN WILLOWHERB *(Epilobium ciliatum)*	4	-	100
SWAMP HORSETAIL (*Equisetum fluviatile*)	1	-	100
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	93	-	100
NARROW REEDGRASS *(Calamagrostis stricta)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION RANGE: 1430M

SOIL DRAINAGE: POORLY

FORAGE PRODUCTION KG/HA

GRASS	3994
FORB	16
TOTAL	4010

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.5 HA/AUM or 0.8 AUM/AC

H6: Subalpine fir blocks (Castle)

(Abies lasiocarpa)

n=9 These cutblocks represent higher elevation sites within the Castle area. Subalpine fir is usually indicative of the Subalpine subregion (Archibald et al. 1996).

Plant Composition

Plant Composition	Canopy Cover (%) Mean	Range	Const.
Trees			
Lodgepole pine *(Pinus contorta)*	3	0-15	55
White spruce *(Picea glauca)*	6	0-15	55
Subalpine fir (*Abies lasiocarpa*)	24	15-60	100
Shrubs			
Thimbleberry *(Rubus parviflorus)*	17	0-54	78
Snowberry *(Symphoricarpos occidentalis)*	1	0-2	44
False azalea *(Menziesia ferruginea)*	10	0-58	44
Forbs			
Wild strawberry *(Fragaria virginiana)*	10	0-20	78
Showy aster *(Aster conspicuus)*	3	0-9	67
Western meadow rue *(Thalictrum occidentalis)*	4	0-14	67
Fireweed *(Epilobium angustifolium)*	9	1-29	100
Grasses			
Pinegrass *(Calamagrostis rubescens)*	4	0-17	44
Sedge spp. *(Carex spp.)*	4	0-16	56
Kentucky bluegrass (*Poa pratensis*)	2	0-8	33

Environmental Variables

Moisture regime: mesic

Nutrient regime: mesotrophic

Elevation: 1652(1494-1798)m

Aspect: Variable

Slope: 21(8-37)%

Soil drainage: moderately Well

Forage Production Kg/ha

Grass	550(32-1030)
Forb	1106(470-1802)
Shrub	190(0-650)
Total	1846(1222-2484)

Ecologically sustainable stocking rate
1.0 ha/AUM or 0.4 AUM/ac

H7: Pine-Spruce/Pinegrass (Castle)

(Pinus contorta-Picea glauca/Calamagrostis rubescens)

n=56 This community type is typical of undisturbed cutblocks in the Castle area of the province. Many of these cutblocks are not regenerating trees. It is not clear if these sites are not regenerating trees because they were historically grasslands or if some other factor is influencing tree regeneration.

Plant Composition

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
Trees			
Lodgepole pine (*Pinus contorta*)	10	0-30	90
White spruce (*Picea glauca*)	5	0-40	59
Shrubs			
White meadowsweet (*Spiraea betulifolia*)	3	0-10	64
Thimbleberry (*Rubus parviflorus*)	3	0-21	41
Snowberry (*Symphoricarpos occidentalis*)	3	0-25	63
Forbs			
Strawberry (*Fragaria virginiana*)	11	0-28	89
Fireweed (*Epilobium angustifolium*)	5	0-34	84
American vetch (*Vicia americana*)	3	0-11	71
Yellow peavine (*Lathyrus ochroleucus*)	3	0-6	68
Showy aster (*Aster conspicuus*)	3	0-5	58
Grasses			
Pinegrass (*Calamagrostis rubescens*)	15	0-42	64
Kentucky bluegrass (*Poa pratensis*)	4	0-6	71
Sedge spp. (*Carex spp.*)	5	0-28	46
Timothy (*Phleum pratense*)	2	0-13	48

Environmental Variables

Moisture regime: Mesic

Nutrient regime: mesotrophic

Elevation: 1529(1432-1800)m

Aspect: Variable

Slope: 13(0-33)%

Soil drainage: Well

Forage Production kg/ha

Grass	689(42-2698)
Forb	804(104-1732)
Shrub	158(0-588)
Total	1646(378-3582)

Ecologically sustainable stocking rate
2.6 (1.9-6.6) ha/AUM
0.16(.06-0.21) AUM/ac

H8: Pine blocks (Porcupine hills)

(Pinus contorta)

n=4 This community type is typical of undisturbed cutblocks with northerly aspects in the Porcupine Hills. Many of these cutblocks are not regenerating trees. It is not clear if these sites will always have difficulty growing trees because they were historically grasslands or if some other factor is influencing tree regeneration.

Plant Composition — Canopy Cover (%)

	Mean	Range	Const.
Trees			
Lodgepole pine *(Pinus contorta)*	1	0-1	25
Aspen *(Populus tremuloides)*	1	0-3	50
Shrubs			
Rose *(Rosa acicularis)*	4	0-6	75
Raspberry *(Rubus idaeus)*	2	0-4	50
White meadowsweet *(Spiraea betulifolia)*	3	0-5	50
Thimbleberry *(Rubus parviflorus)*	2	0-7	25
Forbs			
Strawberry *(Fragaria virginiana)*	2	0-7	75
Heart-leaved arnica *(Arnica cordifolia)*	4	0-9	75
Showy aster *(Aster conspicuus)*	4	0-8	75
Bunchberry *(Cornus canadensis)*	6	0-14	75
Grasses			
Hairy wild rye *(Elymus innovatus)*	4	0-10	75
Pinegrass *(Calamagrostis rubescens)*	15	1-27	100

Envrionmental Variables

Moisture regime: Mesic

Nutrient regime: Mesotrophic

Elevation range: 1500(1485-1524) M

Aspect: South to Southwest

Slope: 13(10-15)%

Soil drainage: Well

Forage Production Kg/ha

Grass	707(292-1224)
Forb	95(20-158)
Shrub	62(0-152)
Total	864(312-1534)

Ecologically sustainable stocking rate
2.6 (1.9-6.6) ha/AUM
0.16(.06-0.21) AUM/ac

H9: Douglas fir blocks (Porcupine hills)

(Pseudotsuga menziesii)

n=4 This community type is typical of undisturbed cutblocks with south and west aspects in the Porcupine Hills. Many of these cutblocks are not regenerating trees. It is not clear if these sites will always have difficulty growing trees because they were historically grasslands or if some other factor is influencing tree regeneration.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	1	0-3	25
SHRUBS			
ROSE *(Rosa acicularis)*	2	1-4	100
RASPBERRY *(Rubus idaeus)*	5	0-14	75
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	1-4	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	3	1-7	100
HEART-LEAVED ARNICA *(Arnica cordifolia)*	5	0-10	75
SHOWY ASTER *(Aster conspicuus)*	9	3-15	100
BUNCHBERRY *(Cornus canadensis)*	4	0-8	75
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	16	8-31	100
PINEGRASS *(Calamagrostis rubescens)*	10	0-32	75

ENVRIONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC-MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1608(1524-1676) M

ASPECT: SOUTH TO SOUTHWEST

SLOPE: 16(10-30)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	1710(846-2778)
FORB	528(386-606)
SHRUB	191(68-422)
TOTAL	2429(1300-3806)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.6 (1.9-6.6) HA/AUM
0.16(.06-0.21) AUM/AC

H10: Scarified blocks (Porcupine hills)

(Pinus contorta)

n=6 This community type is typical of scarified cutblocks with south and west aspects in the Porcupine Hills. The forest industry often scarifies harvested blocks to increase bare soil when planting conifer seedlings. Scarification rapidly changes the species composition of the block. Ungrazed scarified blocks are often dominated by raspberry, thistle, dandelion, clover and invasive agronomic species like timothy and Kentucky bluegrass.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	9	0-20	75
SHRUBS			
ROSE *(Rosa acicularis)*	5	1-13	100
RASPBERRY *(Rubus idaeus)*	3	0-4	75
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-7	50
FORBS			
STRAWBERRY *(Fragaria virginiana)*	3	1-4	100
HEART-LEAVED ARNICA *(Arnica cordifolia)*	2	0-3	75
SHOWY ASTER *(Aster conspicuus)*	8	2-21	100
CANADA THISTLE *(Cirsium arvense)*	2	0-4	75
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	7	1-15	100
PINEGRASS *(Calamagrostis rubescens)*	6	1-12	100
TIMOTHY *(Phleum pratense)*	14	3-19	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	8	4-9	100

ENVRIONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC-MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1400 M

ASPECT: SOUTH TO SOUTHWEST

SLOPE: 16(10-30)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

TOTAL 2000 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.6 (1.9-6.6) HA/AUM
0.16(.06-0.21) AUM/AC

MONTANE SUBREGION

CYPRESS HILLS ECODISTRICT

Photo 11. This photo is typical of the mosaic of plant communities found in the Cypress Hills. The northerly aspects are dominated by trees and the south and western facing slopes are dominated by grasslands with shrubs growing in the moist draws.

Cypress Hills ecodistrict

The Cypress Hills ecodistrict is an unglaciated plateau ranging in elevation from about 1300 m in the east to1465 m at the highest point. Once considered boreal foothills, the area has been reclassified as montane given the bimodal summer precipitation peaks (June and September), the potential for freezing temperatures in all months and the combination of closed-canopied lodgepole pine forest with fescue grassland (Strong and Leggatt 1992). Soil parent materials are somewhat unique on the plateau where ancient tertiary gravels are exposed, or, may be capped by a variable veneer of loess; fine silty material deposited by wind from post glacial lake beds to the west of the plateau. Soils are mostly Black Chernozems where grassland vegetation has dominated. Thelma soils are loamy Orthic Black Chernozems associated with rough fescue communities on the top of the bench. Also associated with rough fescue cover, Delmas and Marmaduke soil series are gravel and shallow to gravel Orthic Dark Brown Chernozems found on the shoulder of the escarpment. Orthic Dark Grey Luvisols, like the soils series Reesor (loamy) have developed where lodgepole pine or aspen forest have prevailed (Greenlee 1981).

Plant communities described in the Cypress Hills are associated with the nearly level plateau or the upper edges of the steep escarpment or rolling uplands. They include a mixture of rough fescue grassland and closed canopy aspen and lodgepole pine dominated forests. The Rough fescue (*Festuca campestris* Rydb.) related plant communities of the Cypress Hills Plateau are unique in the relatively high canopy of Shrubby Cinquefoil (compared to fescue communities described in southwestern Alberta and appears to be a function of the gravelly soil) and the abundance of Intermediate oat grass, a major subdominant grassland species (Moss 1955). On the steep, dry slopes Western Porcupine grass often replaces Intermediate oatgrass in these grassland communities. Idaho fescue also replaces Intermediate oatgrass on shallower soils with gentler slopes. An unresolved issue is the apparent expression of Rough fescue as the Foothills Rough fescue (*F. campestris* Rydb.) bunch grass type on the top of the plateau and the Plains Rough fescue (F. hallii Vassey) rhizomatous form on the adjoining slopes of the Cypress Hills.

Table 6. Plant community types of the Montane subregion and Cypress Hills ecodistrict.

Community name	Community type	Productivity(kg/Ha) Grass	Forb	Shrub	Total	Moisture	Drainage	Carrying capacity (ha/AUM)
I.	**Cypress Hills ecodistrict**							
I1.	Foothills rough fescue-Western porcupine grass	1361	62	-	1423	Submesic	Well	0.6
I2.	Shrubby cinquefoil/Foothills rough fescue-Intermediate oatgrass	1980	278	-	2258	Mesic	Well	0.4
I3.	Shrubby cinquefoil/Foothills rough fescue-Golden bean				1928*	Mesic	Well	0.5
I4.	Shrubby cinquefoil/Foothills rough fescue-Idaho fescue				1850*	Mesic	Well	0.5
I5.	Snowberry/Kentucky bluegrass-Timothy				1245*	Mesic	Well	0.7
I6.	Silverberry/Kentucky bluegrass				1250*	Mesic	Well	0.7
I7.	Pl-Aw/Bunchberry/Moss	243	433	30	706*	Mesic	Well	2.7

*Estimate

Key to grassland community types in the Cypress Hills ecodistrict

1. Shrubby cinquefoil or rough fescue dominated sites.. **2**
   Moister sites dominated by snowberry or silverberry.. **5**
2. Shrubby cinquefoil dominated communities.. **3**
   Shrubby cinquefoil greatly reduced, site is found on slopes and dominated by Foothills rough fescue and Western porcupine grass.. **Foothills rough fescue-Western porcupine grass I1**
3. Ungrazed communities dominated by rough fescue and codominated by Intermediate oatgrass or Idaho fescue.. **4**
   Patched grazed community dominated by rough fescue and golden bean .. **Shrubby cinquefoil/Foothills rough fescue-Golden bean I3**
4. Modal grassland community codominated by Intermediate oatgrass.. **Shrubby cinquefoil/Foothills rough fescue-Intermediate oatgrass I2**
   Site with shallower soils codominated by Idaho fescue....**Shrubby cinquefoil/Foothills rough fescue-Idaho fescue I4**
5. Seepage area dominated by silverberry................ **Silverberry/Kentucky bluegrass I6**
   Seepage area dominated by snowberry................ **Snowberry/Kentucky bluegrass I5**

I1. Foothills Rough Fescue - Western Porcupine Grass

(Festuca campestris - Stipa curtiseta) Shrub Herbaceous

n=10 This is the reference plant community for thin break and gravel range sites in the upper slopes of the Cypress Hills. There remains some uncertainty about the species of rough fescue found from the upper slopes of the Cypress Hills, down slope to the lower slopes of the mixed grassed. On the Cypress Hills bench, rough fescue expresses as a bunch grass and then as a sod forming species as you progress downslope. Genetic studies proposed by Agriculture Canada may clear up this point of confusion in the future. Coupland (1961) described this plant community and our analysis suggests that it is found on the drier thin break and gravel influenced sites adjoining the Cypress Hills plateau and upper slopes. This community is very similar to the MGA1 community in the adjoining mixed grass natural subregion. Subdominant species in this community more closely resemble the shrubby cinquefoil/rough fescue-Intermediate oatagrass community of the plateau, while the MGA1 more closely resembles the adjoining dry mixed grass prairie. Mid-summer aridity is a common feature of these rangeland soils given their exposure and coarse texture. Conservative stocking rates are needed to require adequate litter. Productivity data is presented from the Blue Field rangeland reference area.

Soil Exposure: 6 % (0-17) **Moss/Lichen Cover:** 3 % (0-11) **Total Vegetation:** 84 % (67-95)

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST
SHRUBS			
SILVERBERRY			
(*Elaeagnus commutata*)	1	0-5	30
COMMON WILD ROSE			
(Rosa woodsii)	4	0-13	70
FORBS			
GOLDEN BEAN			
(Thermopsis rhombifolia)	4	0-8	90
PASTURE SAGEWORT			
(Artemisi frigida)	2	0-5	80
GRASSES			
FOOTHILLS ROUGH FESCUE			
(Festuca campestris)	18	9-36	100
WESTERN PORCUPINE GRASS			
(Stipa curtiseta)	10	4-20	100
SEDGE			
(Carex spp.)	6	0-27	70
NORTHERN WHEAT GRASS			
(Agropyron dasystachyum)	6	0-15	70
HOOKER'S OAT GRASS			
(Helictotrichon hookeri)	5	0-13	90
JUNE GRASS			
(Koeleria macrantha)	4	0-15	90
BLUEBUNCH FESCUE			
(Festuca idahoensis)	3	0-18	60
KENTUCKY BLUEGRASS			
(Poa pratensis)	2	0-9	30

ENVIRONMENTAL VARIABLES

RANGE SITE
THIN BREAKS, GRAVEL
SOILS
ORTHIC BLACK (DEMPSTER)
ORTHIC DARK BROWN (DELMAS, MARMDUKE)
ELEVATION (M): 1395
SOIL DRAINAGE:
WELL DRAINED
SLOPE :
STRONG SLOPE
ASPECT:
SOUTHERLY
ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1361 (831-1804)
FORB	62 (11-188)
SHRUB	NOT AVAILABLE
TOTAL	1423
LITTER	1039 (613-2311)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.6 HA/AUM OR 0.65 AUM/AC

I 2. Shrubby Cinquefoil/Foothills Rough Fescue - Intermediate Oat Grass

(Potentilla fruticosa/Festuca campestris - Danthonia intermedia) Shrub Herbaceous

n=37 This is the reference plant community for loamy and shallow-to-gravel range sites on top of the Cypress Hills plateau at about 1400 m elevation, and is associated with Thelma (THA) soils, orthic black chernozems developed on loess deposits over tertiary gravels. Rough fescue expresses itself as the F. campestris, bunch grass type on the plateau while it appears as F. hallii, the rhizomatous type on the upper breaks and slopes of the plateau. This plant community has been described by Moss (1955) and Coupland (1961) who noted intermediate oatgrass as key subdominant species to rough fescue on the Cypress Hills plateau, vs. Parry's oatgrass in montane grasslands of southwestern Alberta (Willoughby et al 2001). Shrubby cinquefoil contributes a much higher canopy cover in this community type at a mean cover of 14% versus about 3% in the foothills Montane community described by Willoughby et al 2001. Shrubby cinquefoil, intermediate oatgrass, Idaho fescue and a number of forb species will increase with grazing pressure. With control of wildfires, this community appears to be vulnerable to conifer encroachment, especially lodgepole pine. Like foothill rough fescue communities, this community tends to have low soil exposure and a low cover of moss and lichen. The community is highly productive and in the absence of grazing or fire will produce a very heavy litter build up. In the absence of grazing rough fescue will grow to the exclusion of other species (Moss and Campbell 1947).

Soil Exposure: 0(0-1) **Moss/Lichen Cover: 3 % (0-98)** **Total Vegetation: 90 % (4-98)**

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	14	0-47	95
FORBS			
SILVERY PERENNIAL LUPINE *(Lupinus argenteus)*	3	0-11	51
THREE-FLOWERED AVENS *(Geum triflorum)*	4	0-17	73
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-10	92
COMMON YARROW *(Achillea millefolium)*	1	0-3	92
GRASSES			
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	38	11-80	100
INTERMEDIATE OAT GRASS *(Danthonia intermedia)*	12	0-42	95
BLUEBUNCH FESCUE *(Festuca idahoensis)*	3	0-22	76
SUN-LOVING SEDGE *(Carex pensylvanica)*	3	0-11	81
SLENDER WHEAT GRASS *(Agropyron unilaterale)*	1	0-6	57
KENTUCKY BLUEGRASS *(Poa pratensis)*	1	0-11	41
NORTHERN WHEAT GRASS *(Agropyron dasystachyum)*	1	0-12	35

ENVIRONMENTAL VARIABLES

RANGE SITE
LOAMY, SHALLOW TO GRAVEL
SOILS
ORTHIC BLACK (THELMA)
OTHIC DARK BROWN (MARAMDUKE)
ELEVATION (M): 1400
SOIL DRAINAGE: WELL DRAINED
SLOPE: LEVEL
ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	1980 (1577 - 2650)
FORB	278 (130 - 550)
SHRUB	NOT AVAILABLE
TOTAL	2258
LITTER	2959 (1902 - 5405)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.4 HA/AUM OR 1.0 AUM/AC

I3. Shrubby Cinquefoil / Foothills Rough Fescue -Golden Bean

(Potentilla fruticosa / Festuca campestris - Thermopsis rhombifolia) Herbaceous Shrub

n=17 This is a mid to late seral plant community on loamy and shallow-to-gravel range sites on the top of the Cypress Hills plateau, and is associated with orthic black chernozems (Thelma) and orthic dark browns (Marmaduke). This plant community has a mixed structure of lightly grazed and heavily grazed patches that results in many fescue grasslands as a result of light stocking and summer grazing use. Cattle will graze rough fescue more uniformly under winter grazing use but under summer grazing will often choose other associated species first (Willms and Rode 1997). More heavily grazed micro patches will be dominated by intermediate oatgrass and forbs and taller and more rank cover will be dominated by shrubby cinquefoil and rough fescue.

Soil Exposure: 1 % (0-6) **Moss/Lichen Cover:** 0 % (0-2) **Total Vegetation:** 96 % (88-98)

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST
SHRUBS			
SHRUBBY CINQUEFOIL (*Potentilla fruticosa*)	5	0-21	53
FORBS			
GOLDEN BEAN *(Thermopsis rhombifolia)*	10	4-18	100
SILVERY PERENNIAL LUPINE *(Lupinus aregenteus)*	4	0-16	53
GRASSES			
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	44	25-65	100
NORTHERN WHEAT GRASS *(Agropyron dasystachyum)*	2	0-10	88
INTERMEDIATE OAT GRASS *(Danthonia intermedia)*	10	2-7	47
SUN-LOVING SEDGE *(Carex pensylvanica)*	2	0-7	71
BLUEBUNCH FESCUE *(Festuca idahoensis)*	1	0-9	47
SLENDER WHEAT GRASS *(Agropyron unilaterale)*	1	0-9	65
HOOKER'S OAT GRASS *(Helictotrichon hookeri)*	1	0-6	53
JUNE GRASS *(Koeleria macrantha)*	1	0-2	53

ENVIRONMENTAL VARIABLES

RANGE SITE
LOAMY AND SHALLOW TO GRAVEL
SOILS
ORTHIC BLACK (THELMA)
ORTHIC DARK BROWN (MARMADUKE)

ELEVATION (M): 1400 M

SOIL DRAINAGE:
WELL DRAINED
SLOPE :
LEVEL
ASPECT:
NORTHERLY
ECOLOGICAL STATUS SCORE: 16

FORAGE PRODUCTION (KG/HA)

GRASS	NOT AVAILABLE
FORB	NOT AVAILABLE
SHRUB	NOT AVAILABLE
LITTER	NOT AVAILABLE
TOTAL	1928 *ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.5 HA/AUM OR 0.8 AUM/AC

I4. Shrubby Cinquefoil / Foothills Rough Fescue - Idaho Fescue

(Potentilla fruticosa / Festuca campestris - Festuca idahoensis) Herbaceous Shrub

n=6 This is a reference plant community for shallow-to-gravel range sites on the Cypress Hills Plateau. Though the shrubby cinquefoil/foothills rough fescue - intermediate oatgrass community type is most common on the plateau, this community type occurs on similar soils but with thinner loess deposits over gravels (Thelma and Marmaduke). This community type tends to have a lower canopy cover of shrubby cinquefoil and a greater ground cover of moss/lichen compared to I2. With grazing pressure, Idaho fescue and forb cover will increase significantly.

Soil Exposure: 1 % (0-3) **Moss/Lichen Cover:** 18 % (0-98) **Total Vegetation:** 80 % (4 -98)

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST
SHRUBS			
SHRUBBY CINQUEFOIL (*Potentilla fruticosa*)	5	0-13	83
FORBS			
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-10	67
ALPINE HEDYSARUM *(Hedysarum alpinum)*	2	0-8	67
SHINING ARNICA *(Arnica fulgens)*	2	0-7	50
SLENDER BLUE BEARDTONGUE *(Penstemon procerus)*	1	0-6	50
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	1	0-5	50
GOLDEN BEAN *(Thermopsis rhombifolia)*	1	0-3	50
GRASSES			
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	52	23-80	100
BLUEBUNCH FESCUE *(Festuca idahoensis)*	10	1-22	100
INTERMEDIATE OAT GRASS *(Danthonia californica)*	9	2-19	100
SUN-LOVING SEDGE *(Carex pensylvanica)*	1	0-2	67
SEDGE *(Undifferentiated Sedge)*	1	0-3	33

ENVIRONMENTAL VARIABLES

RANGE SITE
SHALLOW TO GRAVEL
SOILS
ORTHIC BLACK (THELMA)
ORTHIC DARK BROWN (MARMADUKE)
ELEVATION (M):
1400
SOIL DRAINAGE:
WELL DRAINED
SLOPE :
LELVEL
ASPECT:

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION (KG/HA)

GRASS	NOT AVAILABLE
FORB	NOT AVAILABLE
SHRUB	NOT AVAILABLE
LITTER	NOT AVAILABLE
TOTAL	1850* ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.5 HA/AUM OR 0.8 AUM/AC

I5. Buckbrush / Kentucky Bluegrass - Timothy

(Symphoricarpos / Poa pratensis - Phleum pratense) Shrub Herbaceous

n=3 This is a modified plant community where disturbance history has resulted in the replacement of native species by invasive agronomic species and weeds. This plant community may provide reasonable forage production during wet years but will produce little forage in average moisture to dry years. Forage quality declines rapidly as forages mature and the community has little value for dormant season grazing. Based on current knowledge, there seems to be little potential for this community to recover to a native stand. Grazing management should aim to promote vigor and productivity of Timothy and Brome grass to reduce the relative cover of Kentucky bluegrass and provide more competition to weed species like Canada thistle.

Soil Exposure: 0 % (0-0) **Moss/Lichen Cover:** 0 % (0-0) **Total Vegetation:** 98 % (98-98)

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST
SHRUBS			
Buckbrush (*Symphoricarpos occidentalis*)	25	19-30	100
FORBS			
Canada Thistle *(Cirsium arvense)*	5	0-10	67
Common Goat's Beard *(Tragopogon dubius)*	5	0-14	33
Tufted White Prairie Aster *(Aster ericoides)*	2	0-5	67
Golden Bean *(Thermopsis rhombifolia)*	2	0-4	67
GRASSES			
Kentucky Bluegrass *(Poa pratensis)*	39	22-66	100
Timothy *(Phleum pratense)*	5	0-14	67
Awnless Brome *(Bromus inermis)*	5	0-16	33
Slender Wheat Grass *(Agropyron unilaterale)*	1	0-4	33
Northern Wheat Grass *(Agropyron dasystachyum)*	1	0-3	33
Green Needle Grass *(Stipa viridula)*	1	0-2	67
Foothills Rough Fescue *(Festuca campestris)*	1	0-2	33

ENVIRONMENTAL VARIABLES

Range Site
Loamy, Gravel, Shallow-to-Gravel
Soils
Orthic Black (Dempster, Thelma)
Orthic Dark Brown (Marmaduke)
Elevation (m):
1400 m
Soil Drainage:
Well Drained
Slope :
Nearly level
Aspect:
Ecological status score: 8

FORAGE PRODUCTION (KG/HA)

Grass	Not Available
Forb	Not Available
Shrub	Not Available
Litter	Not Available
Total	1250*estimate

Ecologically sustainable stocking rate
0.7ha/AUM or 0.57 AUM/ac

16. Silverberry / Kentucky Bluegrass

(Elaeagnus commutata / Poa pratensis) Shrub Herbaceous

n=1 The silverberry dominated plant communities occur on alluvial floodplain terraces, in V-shaped ravines and swale-like depressions where overland flows provide additional moisture (Thompson and Hansen 2002). Where silverberry is very dense forage production is very low, however in more open stands livestock use can be extensive which leads to the invasion of Kentucky bluegrass, Timothy and dandelion. In the absence of disturbance silverberry dominated communities can undergo succession to aspen or balsam poplar and then white spruce.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST
SHRUBS			
SILVERBERRY *(Elaeagnus commutata)*	30	-	100
ROSE *(Rosa acicularis)*	20	-	100
BEBB WILLOW *(Salix bebbiana)*	10	-	100
FORBS			
DANDELION *(Taraxacum officinale)*	10	-	100
CLOVER *(Trifolium repens)*	10	-	100
GIANT GOLDENROD *(Solidago gigantea)*	10	-	100
CANADA THISTLE *(Cirsium arvense)*	1	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	10	-	100
TIMOTHY *(Phleum pratense)*	20	-	100
AWNLESS BROME *(Bromus inermis)*	3	-	100
BALTIC RUSH *(Juncus balticus)*	10	-	100

ENVIRONMENTAL VARIABLES

RANGE SITE
LOAMY, GRAVEL, SHALLOW-TO-GRAVEL
SOILS
ORTHIC BLACK (DEMPSTER, THELMA)
ORTHIC DARK BROWN (MARMADUKE)
ELEVATION (M):
1400 M
SOIL DRAINAGE:
WELL DRAINED
SLOPE :
NEARLY LEVEL
ASPECT:
SOUTH AND WEST
ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION (KG/HA)

GRASS	NOT AVAILABLE
FORB	NOT AVAILABLE
SHRUB	NOT AVAILABLE
LITTER	NOT AVAILABLE
TOTAL	1250*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.7HA/AUM OR 0.57 AUM/AC

I7. Pl-Aw/Bunchberry/Moss

(Pinus contorta-Populus tremuloides/Cornus canadensis/Pleurozium schreberi)

n=18 This community is found on northerly aspects, which probably escaped fire and disturbance, allowing succession to occur. Continued succession in the absence of disturbance will likely be to the Sw/Moss dominated community type. This community type is moderately productive for domestic livestock. The higher moisture conditions favour the growth of fireweed and aster spp. These species are moderately palatable to livestock. This community type would be rated as secondary range for domestic livestock.

PLANT COMPOSITION

CANOPY COVER(%)	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	20	10-30	100
LODGEPOLE PINE			
(Pinus contorta)	42	13-69	100
SHRUBS			
SNOWBERRY			
(Symphoricarpos albus)	4	0-21	83
WHITE MEADOWSWEET			
(Spiraea betulifolia)	5	0-18	61
ROSE			
(Rosa acicularis)	3	0-18	78
FORBS			
STRAWBERRY			
(Fragaria virginiana)	4	1-8	100
FIREWEED			
(Epilobium angustifolium)	1	0-1	17
LINDLEY'S ASTER			
(Aster ciliolatus)	4	0-9	94
CANADA VIOLET			
(Viola canadensis)	2	0-10	67
WESTERN MEADOW RUE			
(Thalictrum occidentale)	3	0-9	83
GRASSES			
MOUNTAIN RICEGRASS			
(Oryzopsis asperifolia)	10	0-30	89
PINEGRASS			
(Calamagrostis rubescens)	6	0-17	94
MOSS	46	12-65	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1287M

ASPECT: NORTHERLY

SLOPE: 15(3-45)%

DRAINAGE: MODERATELY WELL

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	243
FORB	433
SHRUB	30
TOTAL	706*ESTIMATE

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 HA/AUM OR 0.15 AUM/AC

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